June 26–July 2 1987 Vol 6 No 25 60p

POPULAR Computing WEEKLY

Acorn launches RISC machine

Details on page 6

ARM Acorn RISC Machine



The Mega STs

Atari's souped-up STs reviewed on page 12

Hall of Fame

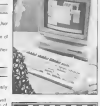
Faery Tale on the Amiga see page 41

Win a day out at Silverstone

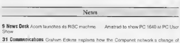
June 26–July 2

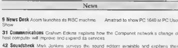
CONTENTS

POPULAR Computing WEEKLY



News

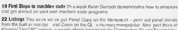




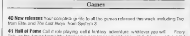
Features



Programming



Games



Editor Christine Erskine **News editor** John Brissenden **Technical editor** Duncan Evans **Production editor** Michelle Beauchamp **Supplements editor** Christopher Jenkins **Supplements designer** Barbora Hajek **Marketing and Advertisement manager** David Osen **Advertisement executives** Jon Beales Athena Pearman **Classified executive** Susannah King **Editorial secretary** Annmarie O'Dwyer **Credit control manager** Gabrielle Pacona **Managing editor** Peter Worlock **Publishing director** Jenny Ireland **Published by** Sunshine Publications Ltd 12–13 Little Newport Street London WC2H 7PP Tel 01 437 4343 Telex 296275 Fax 01 439 0681 **Typeset by** Magazine Typesetters 6 Parnell Court East Portway Andover Hampshire **Printed by** McCorquodale Magazines Andover Hampshire **Distributed by** S M Distribution London SW9 Tel 01 274 8611 Telex 261643

ISSN 0265-0509

How to submit articles Articles which are submitted for publication should not be more than 2000 words long The articles and any accompanying programs should be original It is breaking the law of copyright to copy programs out of other magazines and submit them here – so please do not be tempted We cannot guarantee to return your programs so please do not send your only copy **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish although we will always try our best to make sure programs work

Popular Computing Weekly. Tel: 01-437 4343.

Solve those alignment blues

Ms, I offer the following advice to Commodore 1541 disc drive users who have experienced alignment problems and used Evesham Micros Alignment disc

When using this program to ensure a permanent fix I devised the following modification on both my regular 1541 and the drive in my SX64

At all times using considerable care I dismantled the drive and completely removed the stepper motor from the chassis (or as far as possible with the SX64). The position of the motor was scribed on the underside alongside one of the securing arms. The steel drive had been released from the drive pulley on top of the motor. The motor can then be removed from the chassis and the wire loom carefully unthreaded leaving just the motor and attached wire!

The next step entailed releasing and removing completely the grub screw from within the motor pulley, the same hole into which the steel band was secured

Note liberal amounts of thread locking adhesive have been used throughout original assembly

Once the grub screw is removed by using a 1.5mm watchmakers screw driver the modification can be made

Again using extreme care secure the motor and prevent the drive shaft from rotating – this is very important. By using a drill bit much smaller than the hole and a low powered drill or even a hand drill a small dimple is drilled in the motor shaft down the threaded hole without damage to the threads or re-assembly will be impossible!

If owners do not have the necessary facilities or skills with which to carry out the operation an approach to local tradesmen such as piano tuners watchmakers or instrument technicians could be made

Once the dimple is made the disc drive can be reassembled in reverse order using thread locking adhesive as required apart from motor mounting screws since they need to be free for the subsequent adjustment procedure. Take great care at all times but especially when replacing the steel drive band. Do not twist. Note the tension spring release this to ease replacement of steel band

Make absolutely sure that no swarf remains in the hole or enters the disc drive!

Keith L Moody
Scunthorpe

The caring company

All too often I read in these columns about the appalling service customers receive from some mail order companies. I think it's about time we heard more about those companies who care about their customers

After reading about Spectrum Adventurer in Tony Bridge's column I ordered a copy of its tape magazine which promptly arrived by return of post

I then ordered its adventure *Castle Thade Revisited*. I received a letter from the company saying it was out of stock and that a new version was being written. They offered to return my cheque if I didn't want to wait for it

A week later I received another letter stating that the programmer was ill and that the new version would be delayed. Again I was offered the opportunity of having my cheque returned

When the adventure finally arrived (last week) it was accompanied by a complimentary copy of its tape magazine and an apology for such a delay

Well done Spectrum Adventurer

Peter Watson
Glasgow

Looking for a robot

About two years ago a series of robots which you built yourself from a kit (for around £20) were available

If they still are where can I obtain them from and how much do they cost?

Stephen Chandler
Canvey Island Essex

The offer for the entire kit is no longer available. However, you should be able to put the kit together piecemeal by buying the components separately from local shops

The search for an assembler

I would like to know where I can get hold of a two pass assembler for the Commodore 64. I've tried everywhere but I can only find the normal type

Please can you tell me where I can purchase one and put hundreds of users out of their misery

M Fance
Chigwell Essex

Supersoft is still selling its Mikro two pass assembler for the 64 at £57.50. You can contact the company on 01-861 1166 for details

Incidentally, our apologies if we've got your name wrong – your signature was less than legible

Down with sexism

Another attempt to introduce overt sexism in computing comes in the form of Palace Software's insulting advert on the back of *Popular* June 5

Does Palace really think that using an image of a semi naked woman apparently worshipping a mass murderer is going to boost sales of *Barbarian*?

This advert is insulting in two ways

a) The assumption that the grey matter of its potential consumers is minuscule and solely located between their legs

b) That its market is homogenously male

I was tempted to furtively ask the newsagent to put it in a brown paper bag and creep out looking out for the heavy hand of the Obscene Publications squad as I hurried up the high street feeling distinctly embarassed

I have been trying lately to convince my partner and her daughter that computers are not discerning about the gender of the user. This sort of thing devalues this assertion

I am also horrified at the number of games that promote and glorify murder as a sport. War murder and maiming are not a game. In real life you can't pause it you can't escape you only get one life in the real thing and can't play again if your aggression fails to achieve the end that you desire

Imagine an alien life form surveying the planet. They would find a proportion of the young male population not only re-fighting old wars (war games) but actively practising the welcome for visitors of another intelligence with lasers nuclear war heads and apparently suicidal desire to eradicate any visitors from elsewhere

Please can we try and shake off the image of computing (especially for pleasure) is a pastime for males? To continue this falsehood is to alienate the majority of the population. The future of computing lies in widening the user base to diversify the uses of computers

Andy Smith
London NW5

Hear, hear, Ed

Up with Memotech

When the Memotech MTX series of micro computers were first released in late 1983 it was hoped that I would rival the BBC B and ZX Spectrum. The Memotech offered an unprecedented hard and software specification and it had an imaginative design. Memotech also had the foresight to include CP/M 2.2 as an upgrade option long before Amstrad and CP/M caught the imagination of home users

The Memotech's Porsche-like design (*Are you sure about this? Ed*) was matched by its fast and well structured operating system. Not only was the Basic bug free and powerful it incorporated many concepts which only came to the forefront when Apple launched the Mac

Yes the original Memotech machines included windowing and many other graphic features like 16 colour high resolution graphics 32 hardware sprites logo graphic commands all controllable from within Basic without resorting to poking and peeking as on the C64

The Memotech also included a revolutionary concept of NODDY a text orientated language ideally suited for data basing etc. Memotech didn't stop there it included a Z80 line assembler which computer reviewers had been looking for. Also to include its appeal to the experienced Z80 programmers

it included Front Panel a fully blown Monitor/disassembler All this interfaced with Basic and with the Disc system

Remember all this was available in 1983 Only now are other computer owners able to get a Z80 assembler with comparable power, but at a price (£39 95) yes *Devpac 2* (You can even run this under the CP/M environment on the Memotech) The strange coincidence is that you can buy a MTX 512 series 1 for the same price as *Devpac 2* (available from UK Home Computers on 0793 695034) Strange that it s taken four years to equal possibly improve on the Memotech range

A F Wilson
Whitehaven Cumbria

Beware of repair company

I just thought I d write to warn your readers about a repair company The Z80 in my Spectrum 128 (the proper black one) was faulty so I decided to send it to The Specialist Computer Repair Centre as advertised in *Sinclair User* because it offered a 24 hour return service

It also offered £33 of free software so I sent it to them on that Tuesday After many phone calls I received my computer 18 days later My 128 was fine but the free software never arrived

I have phoned twice and written a letter of complaint but I ve heard nothing and don t expect to

T Allen
Dartford Kent

PS Thanks a lot to Alan Sugar for bringing out a stand alone add-on disc drive for all us 128 and Plus 2 owners It s nice to know he cares for us as much as he cares for Amstrad CPC 664 owners

Every computer has its faults

I have noticed once again that your letters page is becoming a my computer is better than youre forum

Every computer has its good and bad points ranging from sound to the availability and price of its software No matter which computer you own someone else s will always seem better

I own a Vic 20 (remember them?) a Spectrum 128 Plus 2 and an Atari 800XL I enjoy using them all as each has good points

Do people who criticise other computers that they do not own do it to justify to themselves their own purchase?

Finally a word of praise to two mail order firms for their speedy service and friendly telephone manner They are Post Haste of Hampshire and Strategic Plus of Middlesex To both of these firms I say a big thank you

T Vanns
Watford

Whose Who's Who is whose?

I was surprised to see the title of the Centaur Communications publication *Who s Who in Computing* above an article about the *Computer Users Yearbook Who s Who* (News Desk May 22)

Who s Who in Computing is a major computer industry title recently acquired by Centaur It will be published again this September and unlike the *Computer Users Yearbook Who s Who* our publication will be a detailed directory of major UK computer sites their equipment the people applications and principal business activity plus a comprehensive directory of computer products and services including hardware software peripherals bureauxs maintenance recruitment and financial services

So although we do like to see the name of our title in print we would prefer not to see it confused with another publication

Frank Rocco
Publisher/Directories Division
Centaur Communications

ST database offer

I would like to tell your readers about a new user database I have set up for Atari ST owners Called *ST Register* (surprise surprise!) the aim is to put ST owners in touch with other ST owners in their area or perhaps with the same interests

The way the database works is this users send me their address details of their system (what model printer etc) and their computing interests with the machine I will put all this information into a database which users can receive a dump of if they send me a blank disc and a stamp to cover return postage

Owners can receive the list on a brand new disc if they send me £2 50 instead If owners have any queries they can contact me on 0467 42536 preferably during the evening

This system works best if as many people as possible take the time to register with me since it will enable owners to find others with the same interests or who will be able to help with some programming or software problem The register has been running for about a month now and already a wide range of owners have written to me Why not join them?

William Hern
Aberdeen

" Hmm—seems a bit risky!"

Correction

A small number of errors crept into the Popular Election listing (June 5 onwards) The corrected lines are shown below

```
270 LET e(party)=INT (RND*45+1) LET c(p
arty)=INT (RND*5+1)

540 LET l=f+1 IF l<6 THEN GO TO 530

640 LET l f+1 IF f<6 THEN GO TO 630
740 LET l=f+1 IF l<5 THEN GO TO 730
840 LET f=f+1 IF f<6 THEN GO TO 830

1120 GO SUB 8000+(l(party)*10) [illegible]
APER 7

1520 IF l$<>"" THEN GO TO 1520 [illegible]
1,3

3065 PRINT AT 9,6,"All [illegible] - ";l(1);"%"
;AT 10,6,"Large [illegible] ";l(2);"%";AT 11
"Moder [illegible] ";l(3);"%";AT 12,6,"Cut [illegible]
";l(4);"%",AT 13,6;"No [illegible] ";[illegible]
;"%"
```

Bishop under attack

In Game One of our readers versus *Colossus* chess tournament the readers have chosen retreat moving their queen back to b7 *Colossus* has continued its aggressive play by attacking the bishop on d6 possibly hoping for a passed pawn late on (see diagram for details)

The next move

How would you contain *Colossus* at this point?

Send your suggested readers move to either Inter Mediates (*Popular Chess*) Freepost Sawbridgeworth Herts CM21 9YA (no stamp needed) or *Popular Chess* Unit 2 The Maltings Sawbridgeworth Herts CM21 0PG (with a stamp) Please note that Freepost is slower than the normal service so if you want to save stamp money get your entry off promptly

Only one vote per person please and all entries must reach either address by Wednesday July 1

The move which gets the most votes will be entered into the game Results and Colossus s response will be published in two weeks time

Next week we return to Game Two where the Readers are playing white

Game One

The moves so far

1	[illegible]	Pc7 c5
2	[illegible]	Nb8-c6
3	[illegible]	Ng8 f6
4	[illegible]	Pe7 e6
5	[illegible]	Nc6 d5
6	[illegible]	Pc7 c6
7	[illegible]	Pb7xc6
8	[illegible]	Ph7 h6
9	[illegible]	Pe5 e4
10	[illegible]	Bf8-d6
11	Pd2 e4	Pe4-d3 (en passant)
12	Ne5xd2	Qd8-c7
13	Nb1-c3	Ke8 g8 o o
14	Pf2-f4	Qc7 b8
15	Nc3-e4	Qb6-d4
16	Pc2-c3	Qd4-d5
17	Ke1 g1 (o-o)	Rf8-e8
18	Be2 f3	Qd5 b5
19	[illegible]	Bc8 f5
20	[illegible]	[illegible]
21	[illegible]	

Acorn RISCs it

ACORN last week launched its new range of 32 bit RISC based machines called the *Archimedes* series proclaiming them the fastest microcomputers in the world

The machines are split into two series of two micros each. The 410 and 440 have more memory and are more easily expandable while the 305 and 310 are cheaper with fewer options

The range also includes *SpringBoard* a plug in board for IBM PCs and compatibles which contains the RISC computer found in the other *Archimedes* machines

Although all machines in the range run a new version of BBC Basic – Basic V Acorn boss Brian Long made it clear that there will be compatibility with legal software written for the Master Compact

As widely predicted last month the BBC has adopted the 300 series as its new micro although Acorn stressed that the existing BBC Master and Master Compact machines will continue to be sold

The new machines have a bundled WIMP environment as well as BBC Basic V. The new standard operating system is called Arthur which Acorn claims offers a high degree of familiarity to users with BBC Micro experience

There will be support for a number of languages – C ISO Pascal Fortran 77 Lisp Prolog and Comal

Acorn announced a long list of applications software under development both by Acorn itself and third party developers. Many of the names are stalwarts of the BBC range including Computer Concepts Clares and Beebug

Leading the field in forthcoming applications are enhanced versions of the View family *Wordwise* and a host of educational products. Few of them however will be available before October

So far two 300 series machines have been announced with prices starting at £940 for a 512K model with a single 3½ inch floppy disc drive of 1Mb unformatted capacity. The price does not include a monitor

The two 400 series machines the 410 and 440 are aimed more at the business user

The range of standard languages and operating environments supported by the machines has already created a significant level of interest from users of computer aided design desktop publishing and expert systems said an Acorn spokesman

The 410 has 1Mb Ram a 3½ inch 1Mb unformatted floppy disc drive a hardware floating point unit option a co processor bus a hard disc controller a four socket back plane and 512K of Rom

Archimedes

Price	Model	305	310	410	440
Box		£940	£1029	£1645	£2704
Mono		£998	£1066	£1704	£2763
Colour		£1175	£1264	£1881	£2940

What is RISC?

RISC stands for Reduced Instruction Set Computer – as opposed to Complex Instruction Set Computer. The main advantage of RISC based machines over CISC-based units is their speed

The RISC instruction set is simpler omitting many of the complex instructions and addressing modes of CISC units

This makes them easier to develop cheaper to produce and able to hold large amounts of memory

The chip in the *Archimedes* machines – ARM the Acorn RISC Machine – can operate at 4 mips (millions of instructions per second)

The announcement is an important one for the micro industry in general and Acorn in particular since *Archimedes* is the first commercially available RISC based microcomputer in the world

Expanding the power of the ARM

Acorn is keen to point out the expandability and emulation capabilities of *Archimedes*. All machines can be expanded by using MS DOS I/O Midi and Rom peripheral modules and there are Ram upgrade kits from 5Mb up to 1Mb for the 305 and from 1Mb to 4Mb for the 410

Acorn plans to release further podules next year including an Ethernet network card and a SCSI card. Third party podules due for release include a modem video frame grabber an A to D interface and an IEEE 488 card

All the machines can be used as emulators of the original BBC Micro 6502 chip with the bundled 6502 emulation software and the Intel 8088 chip with the MS DOS peripheral module. The MS DOS capability may prove an important factor since it can run MS DOS programs with the processing power of the ARM

But a major contribution to this aspect of Acorn's new system is the PC application card *SpringBoard*

SpringBoard executes machine code four times faster than a Dec VAX 11/750 and is a 32 bit computer in its own right so concurrent operations with the host PC can be carried out

SpringBoard has up to 4Mb Ram and can run at up to 4 mips. It will cost about £1000 for a 1Mb version or about £2000 for the 4Mb version

The entire *Archimedes* range will be available directly through 60 or 70 specialist dealers according to Long

Long wouldn't be drawn on sales targets but revealed that Acorn is expecting ARM itself to have a market life of between 10 and 14 years

The BBC series the 300 was available in limited quantities from last week with large scale shipments beginning in September

The 440 is due for delivery in November while the 410 should ship early in the New Year

Amstrad gives City jitters as PC ships early

AMSTRAD has brought forward its UK launch date for the PC1640 and will be previewing the EGA versions of the machine at the PC User Show next week

Limited numbers of the new PC will be shipping in August and volume delivery should begin in September

The move sparked off speculation among City observers that Amstrad's future is not as rosy as it appeared

A number of analysts including Chase Manhattan Securities and Philips and Drew are said to have revised their 1987/88 forecasts for Amstrad downwards

Chase cut its profits forecast from £214m to £180m and Phillips and Drew cut its from £175m to £150m

It was a bad week for Amstrad altogether The forecast revisions were provoked by the PC1640 announcement which was in turn seen as confirmation of market research reports that Amstrad PC sales figures were only half of last September's 70 000 target

Phillips and Drew for one is reported to be unsure about future prospects for the PC1512 saying that the rescheduling of the PC1640 launch will deter sales of the earlier models

The net result of all this was a 20 per cent drop in Amstrad's share price last week

In making the announcement, Amstrad sales and marketing chief Malcolm Miller added a vigorous denial that the company was about to drop the PC1512

There has been persistent rumour that we will be dropping the PC1512 but I can confirm that there is no question of the PC1512 being discontinued

Although the PC1512 has sold well into the business sector we recognise that the corporate customer which we define as bulk orders through central purchase has not bought the PC1512 in large quantities

We expect the PC1640 with EGA to satisfy the demands of this business sector whilst the PC1512 will continue to sell into the smaller commercial operation and into the home for out of hours business applications

Amstrad launched the new PC range at Comdex in Atlanta USA earlier this month The company made clear then its intention to target the machine at the US market with the UK launch originally expected no sooner than the New Year

SOFTWARE HOTLINES

In 1984 the accepted style for writing press releases about computer games was to start off A revolutionary new concept

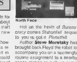
Times have changed however These days, no press release is complete unless it includes the words what could be one of the most controversial pieces of software yet

This week's most controversial game is *High Frontier*. **Activision** has commissioned this title from Alan Steel whose track record must be littered with controversy since he was the co author of **PSS's Theatre Europe**, one of the most controversial etc etc

High Frontier is more of a Theatre SDI with you in charge of the American Strategic Defense Initiative looking after its development and if you play through far enough repelling a Soviet nuclear attack

Leaving any questions about the responsibility of bringing this type of game out aside until we've had a chance to see the finished version (though I hear they do very well on the Russian black market) it will be out next month for Spectrum Commodore and Amstrad machines *High Frontier* costs £9 99 on tape and £14 99 on disc

Infocom is now churning out games at an astonishing rate I can remember when you used to wait agonishingly for months for the next Infocom masterpiece these days another Infocom release whizzes past you before you've got past two locations in the current title



North Face

Hot on the heels of *Bureaucracy* comes *Stationfall* sequel to you've got it *Planetfall*

Author **Steve Moretsky** has brought back Floyd the robot to accompany you on a seemingly routine assignment to a nearby space station to pick up some forms

Once at the space station you discover the place is populated only by an ostrich and Arcturian balloon (a what?) and Plato another robot There's been a *machinery* breakdown and Floyd's showing signs of metal fatigue

Stationfall should be released pretty much nowish on disc only for Commodore 64/128 Amiga CPCs and PCWs Atari 8 bits and STs PCs and clones Apple II and Macintosh Prices range from £25 to £30

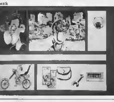
This week's picture plugs are for two French import **Infogrames'** games *North Face* (which was originally called *Bivouac* but someone obviously decided that sounded too French) and *Sidewalk* which is the mono icon screen and looks quite unalterably French

North Face is mountain climbing with arcade adventure elements collect all the ice picks in your quest to find the top of the mountain but watch out for those sneaky avalanches I'd guess

Sidewalk according to Infogrames David Croswellar is really hip which shows his age Let's just say it's jolly nice

Christina Erskine

Sidewalk



US deal for Magister

MAGISTER Software last week announced a licensing deal with US giant Mindscape for its forthcoming release *The Powers of Armelin*

The contract covers North America and Japan while Magister itself will be handling the game in the UK and Europe when it's released early next year

Mindscape publishes much of the best 68000 based games software including *Balance of Power* and the critically de claimed Cincomandre range Its own products are handled by Mirrorsoft in the UK

Magister specialises in 16 bit products *Armelin* was written on the company's target machine the Atari ST and there will be a simultaneous release on the ST with an Amiga version Macintosh and IBM versions will follow

DIARY DATES

JUNE

30 June–2 July
PC User Show
Olympia London
Details Hardware and software for all users of IBM PCs and compatibles
Price £5
Organiser EMAP International Exhibitions
01 608 1161

JULY

10–12 July
Amstrad Computer Show
Alexandra Palace Pavilion London
Details Displays and demonstrations of all latest hardware software and peripherals for Amstrad computers
Price £3 adult £2 children £1 discount for advance booking
Organiser Database Exhibitions
061-456 8835

24–26 July
Acorn User Exhibition
Red Hall Barbican Exhibition Hall London
Details Latest hardware and software plus seminars
Price £2 advance £3 on the door
Organiser Redwood Publishing 01 836 2441 Ext 275

SEPTEMBER

23–27 September
Personal Computer World Show
Olympia London
Details Latest hardware software and peripherals for business and leisure computing
Price £3 £2 – (parties over 10)
Organiser Montbuild
01 486 1951

Prices, dates and venues of shows can vary and you are therefore strongly advised to check with the show organiser before attending *Popular Computing Weekly* cannot accept responsibility for any alterations to show arrangements made by the organiser

ST & Amiga lose out on business software

DESPITE the best efforts and intentions of Commodore and Atari the major business software houses – including Ashton Tate MicroPro Microsoft and Borland – look set to ignore any new markets which may be created by the Amiga A500 and Atari STs

A straw poll of the majors by *Popular Computing Weekly* reveals that they are adamantly refusing to stray from the IBM compatible path

As far as I know we are staying with IBM compatibles and PS/S said a spokeswoman for Borland which spearheaded the drive to low cost software with *Turbo Pascal Turbo Prolog* and *Sidekick* This despite the fact that most Borland products have been converted for the Apple Macintosh

Ashton Tate s marketing director George Fletcher had never even heard of the Amiga

I m not familiar with that machine at all he admitted

MicroPro is another of the companies for which it is IBM or nothing but Mark Plant of Microsoft did at least admit the possibility of the company catering for the 68000 machines

A500 Not familiar with that said Ashton Tate

There is a two pronged answer to this question – firstly in terms of product development decisions are made in the United States Secondly we would have to look at the market and see the penetration and commercial success of the machine

I m sure that they are looking at the Amiga but that would be for them to decide

So although there are a number of business and home productivity packages already appearing for the Amiga and ST it was expected that one or more of these companies would announce their own entry to the market

None has produced a single business package for the Atari ST since its announcement two years ago despite Microsoft s commitment to produce an ST wordprocessor called *Write* which never appeared

This lack of support bodes ill for both machines The difficulty of any machine breaking the business market can be measured by the fact that it took Apple two years to achieve substantial business sales with the Macintosh even with the support of top line business software from Microsoft and Lotus

AMS goes for PC1512

ADVANCED Memory Systems has announced a desktop publishing package for the Amstrad PC1512 which it will be launching at September s PCW Show

Finesse is the latest in a string of AMS DTP packages for machines such as the BBC and Amstrad CPC Details are still sketchy and no price has been announced yet

We ve looked at all the other packages in the market integrated their good parts where possible and added some original ideas to come up with a system that is easy to use said Nick Pierson of AMS

Although the output is at its best from a laser printer the results we have achieved with a 9-pin dot matrix are fantastic

I wanted to prove that you can produce a desktop publishing package that doesn t need a professional typesetter to operate it

The announcement comes just a week after AMS announced it was changing the name of its other packages from *Pagemaker* to *Stop Press* after a minor dispute over the name *Pagemaker* with Aldus the world leader in desktop publishing software

New face appears at Epyx

US GOLD has announced the appointment of Helen Browne as product manager for the Epyx range

Browne was previously at the Lucas Electrical Company and will now have responsibility for European sales distribution and marketing of Epyx products



LARRY HARMON'S
Laurel & Hardy
COMMODORE 64
£9·95
£14·95
Laurel and Hardy
Advance
ADVANCE • SOFTWARE • PROMOTIONS • LIMITED
UNIT 1 • HAROLDS CLOSE • HAROLDS ROAD • HARLOW • ESSEX CM19 5TH
TELEPHONE • 0279 412441
©1987 LARRY HARMON PICTURES CORPORATION

NEXT WEEK

Gold on Micronet

Steve Gold brings you the latest news from the Prestel database Micronet, and developments on the Telecom Gold gateway, which links the two networks.

Microperipherals

MP-480 printer

Sophisticated printing at an unsophisticated price Tony Kendle reports

First steps in machine code

It's the final steps next week, as Kenn Garroch concludes his series on understanding machine code

We'll have further features on learning machine code later in the year.

COMING SOON

Arnor C Compiler

Hard on the heels of all those C packages we were talking about just a few weeks ago comes Arnor's C – a compiler, linker and editor for CP/M Plus machines Kenn Garroch reviews this latest entrant in the field

Graphics

We'll be beginning a new series on how to get the most out of a computer graphics packages – how to turn these straight lines and filled circle facilities into portrayals of Botticelli's Venus

LEARNING QWERTY ON THE IBM PC

Machine IBM PC and compatibles
Item *PC Touch Typist*
Price £29 95
Details *PC Touch Typist* is an interactive typing tutorial aimed at first time users of PCs

Sagesoft MD David Goldman quotes market research which claims that word processing is currently the most popular low cost business software application

This indicates that there are a lot of people who will be using a keyboard for the first time Sage has produced a new package that will enable them to become touch typists quickly easily and affordably he said



Contact Sagesoft NEI House Regent Centre Gosforth Newcastle upon Tyne NE3 3DS telephone 091 284 7077

Masterly Spectrum

Machine Sinclair Spectrum Plus 3
Item *Masterfile Plus 2* database
Price £29 95
Details The latest version of *Masterfile* is a follow up to previous *Masterfile* products for the Spectrum and Amstrad CPC and PCW 8256/8512

Following comments from users *Masterfile Plus 3* has 62K Ram instead of 31K and facilities for table look up file import/export and file merge
Contact Campbell Systems 7 Station Road Epping Essex CM16 4HA

CASH IN HAND ON CPC & PCW

Machine Amstrad CPC 6128 PCW 8256/8512
Item *Cash Book* financial forecasting package
Price £12 95
Details This is aimed at the home and small business market and is described as a simple to use journal/analysis system

The working file can support over 300 entries and the product can produce an infinite number of abstractions and analyses as well as produce statements
Contact Double-Jay Software and Services PO Box 5 Redruth Cornwall TR16 1JJ telephone (0209) 217552

C64 EPROM

Machine Commodore C64 and 128
Item Eprom programmer
Price £75
Details Program 2716, 2732 2764 27128 27256 chips The unit has a programming voltage of 12 5V or 21V and is menu-driven

There are also the following optional extras available Rom board 1 Rom board 2 and an Eprom board for 16 Eproms
Contact: Trilogic 329 Tong Street Bradford BD4 9QY telephone (0274) 684289

Arabic Amstrad

Machine Amstrad CPC 464/6128
Item. *TMC 100* Arabic conversion
Price: To be announced
Details The *TMC 100* is a hardware kit which plugs into the expansion port of the CPC and makes the machine bilingual The conversion makes programming in Arabic and in Arabic Basic possible

The product supports in Arabic and English most dot matrix printers It should be of interest to anyone developing Arabic software or teaching Arabic Basic
Contact. Al Tukham Microcomputer Centre Rodney House Castle Gate Nottingham NG1 7EW telephone (0602) 585737

THE MEGA ST

The first preview of the new Mega ST was held last September. Now, at long last the machines are ready to go, and Duncan Evans has the review

Tramiel's Atari has been renowned for announcing and previewing its machines long before release date and this has certainly been the case regarding the Mega STs. It was at last year's PCW show in September that Atari first revealed, in a back room, away from public inspection, a mock up of a Mega ST.

Well, it's now June and the machines have finally arrived. Are they worth the wait? Read on and see.

Hardware

The design has been completely changed so that as Commodore's Amiga A500 has been rehoused to look like an STF, so the new machines now look like an Amiga 1000. What this means is that the keyboard is now detached from the main unit which houses the main circuitry and the disc drive.

The main unit is a slim affair measuring approximately 13 inches square and just over two inches high. The top is, of course, flat to facilitate the placing of a monitor there. As far as the interfaces go all the old favourites are still present. These include the cartridge port, serial, printer, power cable, Midi In and Midi Out, monitor, hard disc, external disc drive, a slot for the new expansion bus, the on off switch and finally the reset button.

Putting the reset button on the back of the system unit is annoying, as it means that you have to get up and peer round the back of your monitor every time you want to do a reset. There is, of course, no TV modulator, because this is a Serious Machine.

Over on the keyboard unit the only interfaces are two joystick/mouse ports. The actual keyboard itself seems to have been improved, the keys rattle less (although the space bar on the review machine didn't look too well) and have a more positive and sturdy feel to them. Whether it's up to prolonged use in say a word processing capacity only time will tell.

The function keys are still there, in the same slanted styling as the air vents, which now aren't. Pretty though they may be, they are not the most functional of shapes. Something that is still missing is a Caps Lock light, which would have been handy.

A nice addition to the keyboard though are the fold out legs underneath which make it more ergonomic. Looking inside the system unit, the circuit board has been redesigned to cater for the extra Ram chips, blitter and the 68000 expansion bus.

Also inside are a cooling fan (precautionary for when you've got all those extras connected to the bus) and a one megabyte disc drive (720K formatted).

The Ram chips lurk underneath the drive and consist of 32 or 16 one megabit chips (for a 4Mb or 2Mb machine respectively).

The Tos and Gem Rom chips are the same as before except that a couple of bugs have been removed. So all the graphics (including the need for a monochrome monitor in hi res mode), sound, and Midi facilities remain as was.

When the machine is switched on the internal fan revs up and begins to chug away relentlessly. Add to this the noise of



the disc drive rattling away inside the main unit which acts like an echo chamber for it and the result is a pretty noisy system. It's not intolerable by any means and this was a much molested review machine but it would have been nice to have been able to turn the fan off. As the circuit board is so clean and compact and the system box relatively roomy a fan strikes me as being overcautious.

Software

So you've got this great wallop of memory what are you going to do with it. Well for one thing Atari sees the Mega STs as being its bid for the Apple dominated desktop publishing market. All because the forthcoming Atari Laser printer which will probably be around £1000 and certainly under £1500 requires 1.5Mb of the host computer's memory in order to work.

There aren't any and won't be for some time any specific programs for 2Mb machines though 1Mb product is starting to appear especially on the music front. So desktop publishing apart the main use of the extra Ram will be to use existing software to greater effect. Applications in the video digitising sound sampling and music markets particularly when used with a hard disc.

Other uses are really in the productivity department. Imagine a system with a one megabyte Ram disc a large printer spooler all the desktop accessories you like a couple of big applications packages and something like Kuma's *KSwitch* to swap between them.

“The other feature of the new machines is the long awaited for, blitter. The blitter (block image transfer) is the chip which can move large sections of memory around quickly, the area of obvious use being graphics manipulation”

You'd only have to use the drives when you switched the system on and turned it off at the end of the day. It's all possible with a Mega ST.

The other feature of the new machines is of course the much talked about and long awaited for blitter. The blitter (block image transferer) is the chip which can move large sections of memory around quickly the area of obvious use being graphics manipulation.

Realising that software that doesn't follow official procedures in using graphics will crash Atari has incorporated the ability to turn the blitter on and off. Even better this option is available from the desktop under the Options menu. Programmers have also been given a low level call to effect the same thing from within a program.

The main reason that the blitter will cause software to crash is in those programs that instead of going to the A line graphic routines which are accessed by a Trap #14 exception bypass them to use the programmers' own faster routines. This is the price for being naughty.

As far as drawing and fills go the increase in speed is only marginal. The real advantage in having a blitter is in scrolling and animation the latter being enhanced quite substantially.

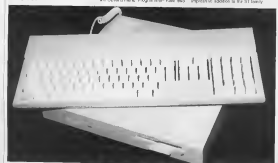
Conclusion

The Mega ST's are undoubtedly powerful machines but there are a couple of design flaws that could have been avoided/rectified in their new configuration the 2080 and 4160 STs are being aimed at the business and scientific markets but it remains to be seen whether Atari can get its act together to promote and organise the machines effectively.

The problem of needing two monitors to display all the graphics modes should have been rectified so it's a shame that Atari haven't taken this opportunity to do so.

Another point to note is that the system box isn't large enough to accommodate a second disc drive. Having an external drive doesn't tend to spoil the smart look to the system.

All that said though the Mega STs represent excellent value in the pence per kilobyte rating around 35p for the 4Mb version and are a useful powerful and impressive addition to the ST family.





Advance ticket application (for use before July 9th)

I am employed in education, please send __________ free tickets for the Trade and Education day

* I am employed in education, please send me __________ tickets at half-price £1.50 each for the 24th, 25th or 26th July 1987

* Please send me __________ advance Public day tickets @ £2.00 each for the 1987 ACORN USER Exhibition

I enclose cheque for £__________
made payable to Redwood Publishing Ltd. Alternatively please charge my Access/Barclaycard no __________

Card expiry date __________

Signature __________ Date __________

Please send tickets to Name __________

Address __________

Send all cheques to Redwood Publishing Ltd.
141-143 Drury Lane, London WC2B 5TF

Please send me details of the seminar programme ☐
Please send me a subscription form for ACORN USER ☐
Educational Computing ☐

* Delete as necessary

PC1

A MUCH BETTER DEAL – WEEK AFTER WEEK

Amstrad PCW 8256 Computer/Word Processor + Monitor + Printer

RRP	WAVE
456.85	355.65 (A)

Amstrad PC1512 Business Pack including PC1512 double drive mono + DMP3000 printer + Supercalc 3 + Wordstar 1512

RRP	WAVE
977.10	598.50 (ANC)

Bondwell BW34 twin drive, green screen 640K inc. 12 month on site warranty

RRP	WAVE
769.35	503.16 (ANC)

Amstrad CF2 3" DS/DD blank disc (cased) box of 10

RRP	WAVE
49.50	18.64 (D)

All current chart games software retail less 25% + £1 P&P
Send 3 18p stamps for fast moving items price list. WAVE PRICES EXCLUDE VAT
ANC 3 day £3.00. Next day £12.00. Admin. Offices. Callers by appointment only
UK Post & Ins. (A) £5.00 (B) £4.00 (C) £3.00 (D) £2.00 (E) £1.00 (F) 50p
Despatched by return of post. Prices in this advert are valid for 14 days

W.A.V.E. (Dept. PCW 2606)
Walney Audio Video & Electrical
53 Shearwater Crescent, Barrow-in-Furness, Cumbria LA14 3JP. Telephone: 0229 44753



Wales Largest Independent Retail Outlet

- Part exchange welcome
- All prices inc VAT excl P & P
- All computer repairs undertaken

* USED *	£	* NEW *	£
Spectrum 48k	39.99	Discple Interface	79.99
Spectrum 48k Plus	49.99	Spectrum 128	78.99
Spectrum 128	59.99	Spectrum 128+2	118.00
Spectrum 128+2	89.90	Commodore 64	150.00
Commodore 64 inc Rec	110.00	Commodore 64 Connoisseur	189.00
MPS 803 Printer	119.00	Commodore 128	189.00
Commodore 128 inc Rec	140.00	Commodore 128D	354.00
Commodore 1541 Disc Drive	99.00	1541C Disc Drive	150.00
MPS801 Printer	79.99	Amstrad 464 inc Mod	179.00
Amstrad 464 inc Mod	99.99	Amstrad 464 inc Col Mon	279.00
Amstrad 464 inc Col Mon	189.00	Amstrad 6128 inc Mod	279.00
Amstrad 6128 inc Mod	199.00	Amstrad 6128 inc Col Mon	360.00
Amstrad 6128 inc Col Mon	275.00	Amstrad PCW8256	430.00
Amstrad PCW8256	350.00	Amstrad PCW8512	530.00
Amstrad PCW8512	450.00	Amstrad PC1512SM	499.00
DMP2000 Printer	110.00	Amstrad PC1512DC	799.00
FD 1 Disc Drive	70.00	Amstrad PC1512/HD20M	999.00
DD 1 Disc Drive	110.00	3" Discs (per 10)	19.99
BBC Model B Series 7	199.00	Cumana 40/80 Disc Drive	150.00
BBC Model B inc DFS	249.00	Commodore 1571 Disc Drive	189.00
Acorn Electron	45.00	1050 Disc Drive	129.00
Atari 800XL	45.00	Atari Data Recorders	24.99
Atari 130XE	79.00	Atari 520STM	249.00
Atari 520ST	169.00	Atari 520STFM	359.00
Atari 520STFM	310.00	Atari ½ meg Drive	139.00
Atari ½ meg Drive	99.00	Atari Mono Monitor	139.00
Atari Mono Monitor	89.00		

Amiga A500 inc Modulator £499.00 (inc VAT)

* NEW *
3½" DS/DD Discs (per 10) £17.00
3" Disc Boxes (holds 20 in cases) £7.99
5¼" Disc Boxes (holds 100) £8.99
5¼" DS-DD Discs (per 10) £8.00

ALL CHEQUES to made payable to G.T. COMPUTERS LTD
21 Charles Street, Newport, Gwent. Tel. (0633) 218854
133 City Road, Cardiff, Glam. Tel. (0222) 493038

WE DON'T SELL CHEAP COMPUTERS!
WE SELL OUR COMPUTERS CHEAP!

The new Disciple for the Spectrum faithful

Christopher Jenkins reviews the revised version of Rockfort's Disciple Multi-Interface for the Spectrum

Recent controversy over Amstrad's disc-based Spectrum Plus 3 has centred on two important aspects: the price, and the impossibility of Plus 2 owners upgrading to the Amstrad's 3 inch disc system.

While the Plus 3's £249 price tag is enough to protect the market position of the £149 Plus 2, many owners of the Plus 2, 128K and Plus must be fuming at the impossibility of adding an Amstrad disc drive to their set-up. However, a partial solution is at hand in the form of the Disciple interface.

The Disciple has been around for some time, but recent improvements ("version 3") plus the topicality of Spectrum disc systems should give it a well deserved boost. Similar in physical appearance to Sinclair's Interface One, and indeed fully compatible with it, the Disciple offers a host of features which we'll look at briefly before covering the all important disc functions.

The Disciple comes supplied with a cassette program which enables you to configure your equipment set-up. Having answered a series of yes/no questions about the disc drives, printers and other peripherals you are using, you can then produce a system disc which is loaded into the interface's Ram before each session.

The Disciple has two standard joystick sockets operating in Sinclair, Kempston or keyboard emulation modes. It has a 26-way (BBC type) Centronics port suitable for a wide range of Epson and other printers, and two network connectors allowing up to 63 similar computer/Disciple systems to communicate.

A through port allows further hardware to be connected, while an inhibit button allows the interface to be disabled in cases of incompatibility. However, most mouse and Midi interfaces apparently will not work with the Disciple at the moment, although plans are in hand to overcome this problem.

So the Disciple is a powerful system interface even without the most significant features, the disc interface and snapshot functions.

The BBC type 34 way IDC connector allows two drives to be connected and significantly they can be of any format you require: 3 inch, $3\frac{1}{2}$ inch or $5\frac{1}{4}$ inch, single or double density.

Rockfort is pushing the Disciple in a package with a $3\frac{1}{2}$ inch drive, largely because this is the most modern and economical system currently available.

Using a 40 track, single density, single sided disc drive, storage is 80K per disc, with data transfer of 125Kbits/sec. The nominal access and load times for a 7K screen display would be 800msec.

At its best, though, with an 80 track doubled sided, double density drive, storage is 780K and data transfer shoots up to 250Kbits/sec. Access time for a 7K screen would now be 350msec.

The Disciple DOS is based on microdrive commands, but offers many more advanced facilities. The CAT command lists the file number (one to 80), name (up to ten characters), number of disc sectors used and type of each file on the disc.

File types include Basic, machine code, screen, microdrive, data array, character array, special files as used by some word processors or assemblers, and snapshot (of which more later). There's also an Execute file which will load itself into the Disciple's disc Ram and auto-run, allowing you to set up a series of different operating systems.

The CAT display also shows the start address of each program and space remaining on the disc. An abbreviated directory is also available using CAT! which just lists the file names.

All the normal Basic saving, loading, renaming and verifying techniques can be used with the Disciple, with the addition of a specifier for the drive in use. If you try to save a file using a name which already exists, the system will ask you if you wish to overwrite the file.

Wildcard facilities are also available for erasing, renaming or copying batches of files.

It's also possible to read and write to sectors of the disc from Basic, making powerful disc editing programs possible.

The Snapshot button on the side of the interface may well be the key to its success. Hold the Caps Shift key and press the button, and any program in memory will be suspended. You then have three options: pressing 3 saves the current screen to disc as a 7K file, pressing 4 saves an entire 48K program to disc, while 5 saves an entire 128K program.

The problem of disc software availability then needn't bother the Disciple owner. 98 per cent of programs tested by developer Miles Gordon Technology transfer easily to disc. This facility is also a boon for games

continued on page 16 ▶

An example of the high quality screen dumps that can be obtained with the Disciple and an Epson printer

> **"The Snapshot button on the side of the interface may well be the key to its success. Hold the Caps Shift key and press the button, and any program in memory may be suspended. You then have three options, depending on how much you want to save"**

◀ continued from page 15
players where there is no other game save facility offered and also allows the user to produce large vertical or horizontal screen dumps using any Epson type printer

In the absence of complete information – Amstrad being reluctant to supply full details of the Plus 3's operating system to other hardware suppliers – Alan Miles speculates that Plus 3 disc software will not work with a 3 inch Disciple system. However he argues that initially there will be very little Spectrum software available on disc which will not also be available on cassette – and therefore available for transfer to disc by Disciple owners.

Disciple owners may even be in a better position than Plus 3 owners in many ways: for instance, they will still be able to use Microdrives if they so wish, which the Plus 3 does not allow. A regular users' magazine, *Format*, contains useful tips, listings and techniques for making the most of the Disciple.

While Alan Miles stresses the Disciple's unique abilities, he's aware that comparisons with the Plus 3 are inevitable. Costwise, assuming that an old Spectrum might be sold for £50 to £70, the £180 to £200 cost of a Disciple and disc drive balances well against the £250 of a Plus 3.

In terms of performance, the Disciple offers up to 780K of continuous access on one drive, while the Plus 3 offers 350K. Speeds are roughly comparable, while 3½ inch discs are certainly cheaper than 3 inch. Using the snapshot facility, the software library available to Disciple owners is very large, though it will not run the CP/M programs which should be available to Plus 3 owners.

The Disciple means that upgrading Spectrum owners do have a choice other than selling their machines and buying a Plus 3. Amstrad's plans for the Spectrum range has left a niche in the market for an imaginative and versatile product.

Product *Disciple Multi Interface* **Micro** Any Spectrum **Price** £89.95; double-sided 80-track single 3.5 inch disc drive, £125; other drives and printers available **Supplier** Rockfort Products, 81 Church Road, London NW4 4DP. 01-203 0191

The Disciple Interface: will it work with the Spectrum +3?

SAMPLE THAT!

The first two samplers for the ST have just been released – Eidersoft's *Pro Sound Designer* and Microdeal's *ST Replay*. Duncan Evans compares the two to find out which is the better product

Sampling. The art of turning sound (an analogue quantity) into the digital information that a computer can understand or use.

Into the fray, competing for the wallets and purses of ST owners, are two low priced samplers. Eidersoft's *Pro Sound Designer* and Microdeal's *ST Replay* are the combatants.

Pro Sound Designer

The hardware plugs into the printer port and sports two 3.5mm jack sockets, one for input, the other for output.

If there's one thing you have to say about *Pro Sound*'s software, it certainly looks good. A centrally placed sound display is framed by bas relief icons on two sides, with a sample display underneath and a double row of yet more icons along the bottom.

Getting to the nitty gritty immediately, *Pro Sound* can sample at 3-30KHz and replay the sound in the same range. The sound can be saved to disc, played through your monitor speaker or played through a hi-fi.

To actually sample something, simply make all the required connections, set the input running (you'll see an oscillating waveform on the main display) and click on the record icon. A good feature is that you can set up a level threshold so that sampling doesn't start until the audio input is loud enough to trigger it.

Once you have the sample in memory it appears in the sample window, wherein you can scroll it from start to finish, a couple of digital counters informing you of how far along you've got. In the window are two movable markers which are used when you want to manipulate parts of the sample.

You can cut sections out and overwrite others, or use the transparent copy option and overlay sections. The advantage of this is that you can create echo effects very easily. The disadvantage is that the overall sound level is decreased afterwards.

When playing a sample back, it is the section between the markers that is replayed, not the whole lot. You can play the sample backwards if you like, and have the whole thing looped for continuous playing.

You can zoom in on the sample, magnifying sections of it for easier editing and then return to the standard resolution.

Along the left side of the waveform display are icons relating to eight function keys. You can program the keys to not store part of the sample, but point to a particular part of the sample.

The other major feature of note is the provision of a sound chip programmer program. Select the chip icon and a couple of panels slide down either side of the main display. You can either program a sound by playing around with the hardware and software registers or load a sound, play it and analyse its various components.

Pro Sound's cover screen

The function keys are again programmable, but this time properly so, anything you save will remain tied to that particular key. Sounds that you save can be incorporated into programs in assembler or C, or turned into data statements for ST Basic and *Fast Basic* users.

Now, ignoring the musical applications, see the conclusion for the reason, the main use of samples is going to be in your own programs. If you're a user of one of the languages mentioned in the last paragraph then you're lucky. *Pro Sound* gives details in the manual, and an example program for C and the basic programmers.

Samples played back from Basic do sound noisier than when using the *Pro Sound* software but even at 8KHz speech is still easily understandable.

The final comment must be on memory usage. Because *Pro Sound* is 113K in length you only get approximately 250K to sample with (on a 520ST). This translates to eight seconds at 30KHz or 30 seconds at 8KHz.

ST Replay

The Microdeal hardware consists of a slim cigarette packet shaped box that plugs into the cartridge port and contains two phono connectors for sound in and out, when not using the monitor speaker. The one big feature that the hardware can claim over the *Pro Sound* board is the provision of a filter to reduce the level of noise.

On the software side things don't look so good. There is no support for Gem at all. No mouse control, no icons, no menus. Instead all the functions are accessed by the keyboard. A single window which covers the entire sample, which you can zoom in on, is the main feature of the display. The rest of it is taken up with instructions and reminders of what the function keys are currently doing.

You can set *ST Replay* up to sample at 5, 7.5, 10, 15, 20 or 31KHz but not any intervening amount. Really the only place where the software scores over *Pro Sound* is in the Monitor function where you can hear an incoming signal being played at the current sampling rate, through the monitor. This gives you an audible cue for when to start sampling. It's still not as effective as *Pro Sound*'s Auto Record option though.

If you want to edit a sample you have to move the two markers around by use of the four cursor keys, an unwieldy and badly conceived idea if ever there was one. You have to set the amount by which the markers move from a choice of large, moderate and very small.

Once there, there is not that much you can do anyway. Merely cut out the section, play it backwards or forwards, or cut and make a duplicate.

You cannot cut out a section and insert it further up or down the sample. Nor can you overlay parts of the sample.

Once you've got the sample that you require you can save it to disc. Hopefully I

◀ continued from page 17

say that because the software takes up so little room in memory you have more memory to sample in. You can sample for 13 seconds at 31KHz but alas you can only save 11 seconds worth on a half megabyte disc drive. In this case the other two seconds are trimmed off.

When it comes to using the samples in your own program Microdeal has gone further than Eidersoft in that as well as assembler and C all three major Basics (Atari, Fast and GFA) are supported with demonstration programs. They all use the same machine code file so are substantially similar. The software appeared to be more fallible than that used by *Pro Sound* so greater care must be taken to get the desired result.

The hardware is really the class part of *ST Replay*, the software being very rudimentary.

The Pro Sound main display

Conclusion

Although both manufacturers are claiming that their samplers can be used by musicians this is not quite true. Neither package supports Midi which greatly diminishes their value to the professional musician, not that the *ST Replay* software is up to scratch anyway. Also their top sampling speed is distinctly average in this sort of market.

Pro Sound boasts decent software and also a sound chip programmer utility against which *ST Replay* counters with better (not a great deal but it is noticeable) sound reproduction due to the built in filter.

Both systems are perfectly usable for the enthusiast and computer programmer and have features to recommend them. It's also nice to be able to report that both manuals make fairly good stabs at explaining how their product works.

Whichever sampler takes your fancy you can't deny that at a mere fifty five pounds the *Pro Sound Designer* package is a real bargain.

Duncan Evans

Product *Pro Sound Designer* **Price** £55 **Supplier** Eidersoft Ltd, The Office, Hall Farm, N Ockendon, Upminster, Essex RM14 3QH

Product *ST Replay* **Price** £129.95 **Supplier** Microdeal Ltd, Box 68, St Austell, Cornwall PL24 4YB

```
3520 RETURN
3530 REM Music envelopes
3540 DATA 0,4,0,1,80,1,0,1,100,2,1,15
3550 DATA 270,1,2,2,340,1,2,6
3560 DATA 39,1,2,15,440,1,1,20
3570 DATA 155,1,2,2,0,0,0,0
3580 :
3590 REM Machine Code Data
3600 DATA 3E6601DE6E0022FA,360
3610 DATA 7F107E0432FD27F80,469
3620 DATA 7E023JFE7F006607,377
3630 DATA 446E0622FE7FC330,303
3640 DATA 0000000000000000,0
3650 DATA 0000000000000000,0
3660 DATA 2APE7FE058FA7FE0,595
3670 DATA 40FC7FC9E51A0077,401
3680 DATA 2313100FRE1040008,229
3690 DATA 0930040150C009C1,210
3700 DATA 0020E8C990000000,300
3710 DATA 0000000000000000,0
3720 :
3730 REM Music data
3740 DATA 239,239,239,330,253,253,253
3750 DATA 253,190,190,190,190,190,190
3760 DATA 142,159,190,190,190,190,190
3770 DATA 000,000,000
3780 DATA 239,239,239,239,253,253,253
3790 DATA 253,190,190,190,190,190,190
3800 DATA 142,159,190,190,190,190,190
3810 DATA 169,157,190,169,169,169,169
3820 DATA 000,000,000
3830 DATA 239,239,253,253,319,319,319
3840 DATA 319,159,159,159,159,169,169
3850 DATA 169,169,190,190,169,169,159
3860 DATA 159,142,142,127,127,159,159
3870 DATA 169,169,169,169,169,169,169
3880 DATA 169,179,179,179,179,239,239
3890 DATA 179,179,190,190,213,213,239
3900 DATA 239,319,319,400,400,400,400
3910 DATA 239,239,239,239,213,213,213
3920 DATA 213,000,000,000,000,000,000
3930 DATA 000,000,000,000,000,000,000
3940 DATA 000,000,000,000,000,190,190
3950 DATA 190,190,159,159,159,159,239
3960 DATA 239,239,239,239,239,239,239
3970 DATA 179,179,179,179,142,142,142
3980 DATA 142,213,213,213,213,213,213
3990 DATA 213,213,190,190,213,213,239
4000 DATA 239,319,319,400,400,400,400
4010 DATA 239,239,239,239,213,213,213
4020 DATA 213,213,213,213,213,190,190
4030 DATA 213,213,239,239,319,319,142
4040 DATA 142,142,142,159,159,159,159
4050 DATA 119,119,119,119,119,119,119
4060 DATA 119,000,000,000,000,000,000
4070 DATA 000,000,000,000,000,000,000
4080 DATA 000,000,000,000,000,000,000
4090 DATA 000,000,000,000,000,000,000
4100 DATA 000,000,000,000,000
4110 :
4120 REM Drum data
4130 DATA 3,9,9,3,3,9,9,9,3,9,9,3,3,9
4140 DATA 9,8,3,9,9,2,2,2,9,9
4150 DATA 3,9,9,3,3,9,9,9,3,9,9,3,3,9
4160 DATA [illegible]
4170 DATA 4,7,9,4,4,4,9,4,4,6,9,4,4,4
4180 DATA [illegible]
4190 DATA 4,6,9,4,4,6,6,4,4,6,6
4200 DATA 7,7,6,9,7,7,6,9,7,7,6,9,7,7
4210 DATA 6,9,7,7,6,9,7,7,7,6,4,4,4,7
4220 DATA [illegible]
4230 DATA 6,9,6,9,6,6,6,9,6,6,6,9,6,6
4240 DATA 6,9,6,6,6,9,9,9,6,9,4,6,9,4
4250 DATA 4,9,3,3,3,3,3,3
4260 DATA 6,6,3,9,6,6,9,9,6,6,5,5,6,6
4270 DATA 9,5,6,6,4,4,2,2,2,2
4280 DATA 4,4,3,3,4,4,3,3,4,4,3,3,4,4
4290 DATA 3,3,4,4,3,3,4,4,4,4
4300 DATA 8,8,8,8,4,4,4,4,2,2,2,2,4,4
4310 DATA 4,4,8,8,4,4,2,2,4,4,6,6,6,6
4320 DATA 9,9,9,9
4330 :
4340 REM Character set data
4350 DATA 126,102,110,118,102,102,126,0,
18,40,18,24,24,24,126,0,126,2,2,126,96,9
6,126,0,126,2,2,30,6,6,126,0
4360 DATA 96,99,96,96,104,126,8,8,126,64
,126,6,6,6,126,0,126,64,64,126,98,98,126
,0,126,2,4,8,16,32,64,0
4370 DATA 126,66,66,126,66,66,126,0,126,
66,66,126,6,6,6,0
4380 DATA 126,66,66,126,98,98,98,0,126,6
6,66,126,98,98,126,0,126,64,64,96,96,96
126,1,254,66,66,98,98,98,254,0
4390 DATA 126,64,64,120,96,96,126,0,126
64,64,120,96,96,96,0,126,64,64,102,98,98
,126,0,66,66,66,126,98,98,98,0
4400 DATA 60,16,16,24,24,24,60,0,126,8,8
,24,24,24,120,0,68,68,68,120,100,100,100
0,64,64,64,96,96,96,126,0
4410 DATA 126,74,74,98,98,98,98,0,66,82,
74,102,98,98,98,0,126,66,66,98,98,98,126
,0,126,66,66,126,96,96,96,0
4420 DATA 126,66,66,98,98,106,126,4,126,
66,66,126,104,100,98,0,126,64,64,126,6,6
,126,0,126,16,16,24,24,24,24,0
4430 DATA 66,66,66,98,98,98,126,0,66,66,
66,66,66,36,24,0,66,66,66,98,106,106,126
,0,102,102,36,24,36,102,102,0
4440 DATA 66,66,126,16,24,24,24,0,126,4,
8,16,32,64,126,0
4450 DATA 0,0,0,3,31,31,63,63,0,15,255,2
55,255,255,255,255,127,127,127,127,255,2
55,255,255
4460 DATA 255,255,255,255,127,127,127,12
7,63,63,31,31,15,3,0,0,255,255,255,255,2
55,255,255,15
4470 DATA 0,240,255,255,255,255,255,255,
0,0,0,192,240,240,240,240,252,252,252,25
2,254,254,254,254
4480 DATA 254,254,254,254,252,252,252,25
2,255,255,255,255,255,255,255,240,240,24
0,240,240,192,0,0,0
4490 DATA 0,0,0,3,7,4,28,31,0,64,160,10,
160,84,162,84,62,127,63,31,15,7,2,0,134,
255,224,192,128,0,0,0
4500 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,127,85,106,85,106,85,127,0,254,126,254
,126,254,126,254,0
4510 DATA 0,127,64,95,95,64,95,64,0,254,
[illegible]
7,0,250,254,170,250,250,2,254,0
4520 DATA 0,3,3,15,31,60,120,240,1,224,2
40,252,124,120,60,0,240,224,240,252,124,
120,31,7,0,0,0,24,24,120,0,0
4530 DATA 0,1,1,1,1,5,3,15,10,0,1,0,128,17
8,192,224,80,10,10,10,10,13,13,13,13,15,80
,80,80,176,120,176,176,208
4540 DATA 0,0,0,7,156,250,252,250,0,0,0,
192,56,254,1,254,252,123,120,124,124,120
,120,48,56,192,0,0,0,0,0,0
4550 DATA 0,0,0,0,0,0,34,16,0,0,0,128,16
0,40,80,160,192,104,10,20,40,80,2,76,128
,32,16,136,64,32,0
4560 DATA 0,0,0,63,64,79,80,64,0,0,0,240
,4,4,20,228,76,81,64,70,81,64,64,63,4,20
,228,4,20,228,4,200
4570 DATA 0,0,0,0,0,0,0,1,0,0,0,0,0,0,22
4,240,3,7,15,31,31,31,15,7,208,208,208,2
40,224,192,128,0
4580 DATA 0,3,3,1,7,15,25,49,0,192,128,1
28,224,240,28,12,49,49,49,48,48,28,15,7,
12,12,140,28,44,28,240,224
4590 DATA 0,0,0,0,0,20,36,64,0,0,0,0,76,
40,36,2,60,102,123,122,126,126,60,0,60,1
02,254,122,126,126,60,0
4600 DATA 0,0,0,1,0,0,0,1,0,0,192,32,144
,72,238,212,3,7,14,28,36,112,36,0,136,0
0,0,0,0,0,0
4610 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
4620 DATA 0,0,3,4,8,16,17,16,0,0,255,0,0
,0,255,0,0,0,192,32,16,0,176,72,18,18,18
,18,16,16,18,18,72,72,72,72,72,68,68,68
4630 DATA 82,89,65,89,89,65,89,65,65,65,
65,65,65,65,66,68,18,18,18,18,18,18,56,7
0,65,65,65,65,68,65,65,127
4640 :
4650 REM Rivets'
4660 DATA 33183,00011,00001,01000,38003
4670 :
4680 REM Object data
4690 DATA TELEPORT PASS,ARM PASS,GALACT
IC GAZETTE,TELEPHONE,OIL,LASER GUN,LUMIN
OUS DOG,BIOTHERMIC PLATE,SYNTHETIC FOOD
TABLET,WATCH,GOG SHADES,TELECOMMUNICATOR
4700 :
4710 REM Examination data
4720 DATA "WRITTEN ON THE PASS CARD IS Y
OUR NAME AND A VALID TRANSPORT NUMBER."
4730 DATA "THERE IS WHAT LOOKS LIKE AN I
DENTIFICATION NUMBER ON THE CARD."
4740 DATA "YOU PAUSE TO READ THE PAPER.
AN ADVERT FOR KHANDAL III CATCHES YOUR E
YE. PRESS SPACE TO RESTART."
4750 DATA "IT'S NOT FOR YOU...."
4760 DATA "A MANUFACTURERS STICKER READS
, HIGH PERFORMANCE ROBOT REFRESHMENT."
4770 DATA "IT LOOKS POWERFULL. MAYBE IT
S FOR A POWERFULL MACHINE."
4780 DATA "WHAT CAN I SAY. IT'S LUMINOUS
!"
4790 DATA "IT COULD BE TOO HOT TO HANDLE
."
4800 DATA "ROAST TURKEY FLAVOUR. MMMMM"
4810 DATA "AH... IT HAS 1 BY FUNCTIONS
INCLUDING HEAT 17 VIDEO MINI HI-FI AN
D INDUSTRIAL SUCTION PUMP."
4820 DATA "WHEN THEY JUST THE COOLEST
."
4830 DATA "IT'S GREEN. SPARKLING, AND G
IVES A CLOSER SHAVE."
4840 :
4850 REM Use data
4860 DATA "YOU TRY TO FOLD THE CARD INTO
 THE SHAPE OF A PAPER AEROPLANE BUT YOU
CAN'T. SO YOU RETURN IT TO YOUR POCKET"
4870 DATA "IT'S NOT THE ACE OF SPADES YO
U KNOW."
4880 DATA "YOU USE THE PUBLICATION TO PR
ACTICE YOUR DRIVING."
4890 DATA "YOU CAN'T PHONE HOME. YOU'VE
BEEN DISCONNECTED."
4900 DATA "NOT YOUR USUAL DEODORANT TYPE
, BUT IT WILL DO."
4910 DATA "POW, POW, PTW, PUT, PUT, OUT
 OUT OF POWER."
4920 DATA "IT CERTAINLY SEEMS TO BRIGHTE
N THE PLACE UP."
4930 DATA "SSSSSST, YOU SEEM TO HAVE SIN
GED YOUR FINGER.
4940 DATA "MMMMM. BOOTIFUL, REAL BOOTIFU
L."
4950 DATA "YOU CAN'T. THE BATTERIES ARE
FLAT."
4960 DATA "YOU CASUAL, HIPSTER PERSON YOU
."
4970 DATA "YOU CUT YOUR TONGUE OFF. HA,
IT'S A BIC DISPOSABLE RAZOR. THAT'LL TEA
CH YOU TO EXAMINE THINGS."
4980 :
4990 REM Icon control
5000 DATA &C001,&9329,6,14,&F931,&9300,4
,13,&0A21,&9380,6,13
5010 :
5020 REM Character data
5030 DATA &80F1,&9339,12,5,22,&0007,&947
2,11,4,21,&E982,&9635,3,4,27,&E19F,&9380
,21,6,20,&D9A4,&9000,25,4,37
5040 :
5050 REM Room chosen
5060 DATA 5,33,33,34,2,17,33,34,3,40,4,1
,41,33,34,17,38,3,37,40,3,49,40,17,32
5070 :
5080 REM Object positions
5090 DATA 0,110,0,0,9,0,0,11,3,0,101,11,
12,0,0,0,4,12,0,0,105,7,0,0,0
5100 :
5110 REM Khandal main
5120 DATA &9590,&9210,&9282
5130 DATA &9000,&9084,&9100
5140 :
5150 REM Character names
5160 DATA LLOYD,DUNCAN,CPR,0602,E16,0001
,MATRAT
```

Zoom

S W Booth

This utility will allow you to zoom any part of memory to any other part of memory. The zoom uses a multiplication factor of eight and can be used in any mode. The code is 218 bytes long and can be loaded in the following fashion

Let zoom=RESPR(218)
LBytes mdv1_ZOOM_bin,zoom

You can then use *Call zoom, start, to, width, height* to activate the routine. *Start* is the address to zoom from (must be even), *to* is the address to start the printing of the zoomed area, *width* is the number of words (wide) that you want to zoom, and *height* is the number of pixels (high) that you want to zoom.

```
100 start=RESPR(218):parity=0
110 FOR loop=0 TO 217
120 READ datum
130 parity=parity+datum
140 POKE start+loop,datum
150 END FOR loop
160 READ checksum
170 IF checksum<>parity:PRINT "ERROR in data.":STOP
180 SBYTES mdv1_ZOOM_bin,start,218
190 STOP
200 DATA 36,65,34,66,83,67,83,68,44,3,42,4,114,255,116
210 DATA 255,112,16,78,65,38,73,40,74,74,1,103,0,0,110
220 DATA 42,4,118,7,7,18,102,4,116,0,96,6,36,60,255
230 DATA 0,255,0,7,42,0,1,102,2,96,6,0,130,0,170
240 DATA 0,170,83,67,7,42,0,1,102,2,96,6,0,130,0
250 DATA 85,0,85,114,7,34,130,211,252,0,0,0,128,81,201
260 DATA 255,246,147,252,0,0,3,252,81,203,255,190,213,252,0
270 DATA 0,0,128,211,252,0,0,3,112,81,205,255,172,84,140
280 DATA 215,252,0,0,0,16,34,75,36,76,81,206,255,154,112
290 DATA 0,78,117,42,4,114,7,3,18,86,194,72,130,3,42
300 DATA 0,1,86,194,118,7,50,130,211,252,0,0,0,128,81
310 DATA 203,255,246,147,252,0,0,3,254,81,201,255,222,213,252
320 DATA 0,0,0,128,211,252,0,0,3,112,81,205,255,204,217
330 DATA 252,0,0,0,2,215,252,0,0,0,16,34,75,36,76
340 DATA 81,206,255,182,112,0,78,117
350 DATA 19748
```


Fx Creator

Sukhbir Singh Ranu

This machine code routine allows you to create sound using any one of the three voices, by typing in a short sequence of number. The syntax for the new command is as follows

Sys 49152, VC, VL, AT, ST, WF, HI, LO, HP, LP

Where *VC* is the voice number (0–2), *VL* is the volume for all three voices (0–15), *AT* is the attack and decay (0–255), *ST* is the sustain and release (0–255), *WF* is the waveform (17, 33, 65 or 129), *HI* is the high frequency of the note (0–255), *LO* is the low frequency of the note (0–255), *HP* is the high pulse of the note (0–15) and *LP* is the low pulse of the note (0–255).

HP and *LO* only come into effect if you select a pulse waveform (65), otherwise leave them out or a syntax error will occur.

The listing, as well as containing the machine code, also features a short demonstration of the command. Press F1, F3 or F7 to select type of sound.

```
80 PRINT "PLEASE WAIT........" I=49152
90 READ D IF D=-1 THEN GOTO 110
100 POKE I,D I=I+1 T=T+D GOTO 90
110 IF T<>16664 THEN PRINT "ERROR IN DATA." END
120 PRINT "USE KEYS 1-9 TO PLAY."
121 I=49152
122 PRINT"DRUMS" AT=7 WF=129 KL=45
125 REM ******* M C DATA *******
130 DATA 32,241,183,138,201,0,240
140 DATA 15,201,1,240,5,201,2,240
150 DATA 3,76,72,178,168,6,105,7
160 DATA 130,221,168,16,0,122,0
170 DATA 212,153,4,212,153,5,212
180 DATA 153,6,212,32,241,183,142
190 DATA 24,212,32,241,183,138,164
200 DATA 251,153,5,212,32,241,183
210 DATA 138,164,251,153,6,212,32
220 DATA 241,183,138,164,251,153
230 DATA 4,212,1,3,262,32,241,183
240 DATA 138,164,251,153,1,212,32
250 DATA 241,183,138,164,251,183
260 DATA 0,212,164,252,201,0,240
270 DATA 1,96,32,241,183,138,164
280 DATA 251,153,2,212,32,241,183
290 DATA 138,164,251,153,2,212,96,-1
300 REM ** DEMO USING DRUMS & PIANO **
301 REM ***DRUMS ON V2 PIANO ON V1 ***
310 GETA$ IFA$="" THEN 310
320 IF A$="" THEN AT=9 WF=33 KL=38 PRINT "PIANO." QW=0 VC=0 GOTO 310
325 IF A$="" THEN PRINT "" QW=1 GOTO 310
330 IF A$="" THEN AT=7 WF=129 KL=45 PRINT "DRUMS." QW=0 VC=1 GOTO 310
340 CK=VAL(A$) IFCK>9 OR CK<1 THEN 310
350 IF QW=1 AND CK>5 THEN WF=129 AT=7 KL=45 VC=1
355 IF QW=1 AND CK<4 THEN WF=33 AT=9 KL=45 VC=0
360 NT=ASC(A$)-KL
370 SYS I VC,15,AT,0,WF,NT,NT
400 GOTO 310
READY
```


Panel Copy

A F Wilson

One of the best features of the Memotech MTX series computers is their built in assembler/disassembler the Panel Unfortunately the one thing missing from it is the ability to dump the contents thereof to a printer This program remedies that problem

(1) For SDX Users

Type in listing then type *GOTO 100* This will autosave the program to disc as *PANEL COD* To use the program just type *USER LOAD PANEL COD* This will reload the program back into memory and auto-initialise itself in high memory Therefore when you enter *PANEL*, function keys F5–F8 are now initialised (see later for meanings)

(2) For SDX/FDX CP/M Users

As in (1) except replace the references to **USER** with *DISC*

(3) For Tape Users

As in (1) except remove the references to **USER** To load use *LOAD "PANELCOD"*

You should now have on disc or tape a program called *PANEL COD* or *PANELCOD* This program is interrupt driven and is at top of free memory therefore it won t be overwritten However when the computer is reset the PANEL extension location at £FA9E is reset and this subroutine will become invisible to the Operating System and PANEL As the program is still in memory at the desired location £8007 you simply re initialise it with *RAND USR(45063)*

The screen is divided up into three key areas The *disassembly* the *registers* and the *Hexdump* at the bottom of the screen This PANEL extension allows you to get a hardcopy of the whole PANEL screen **(F5)** the disassembly and registers **(F6)** the disassembly only **(F7)** and the hexdump only **(F8)** See figure below for a snapshot of the panel whole screen

```
10 CODE

4007 JFANEL:LD A,£C3          ;SET FANEL EXTENSION WITH
4009        LD (£FA9E),A      ;JF £B01C.
400C        LD HL,£B01C       ;
400F        LD (£FA9F),HL     ;
4012 PSTART:LD A,(£FD7D)      ;WHAT WAS THE LAST KEYPRESS.
4015        CF £84            ;CHECK TO SEE IF IT ONE OF
4017        JF Z,F5           ;THE FOLLOWING OPTIONS.
4019        CF £85            ;
401B        JF Z,F6           ;
```

```
408A          JP NZ,PSEND       ;IF NOT F7,KEEP READING.
408C          LD A,(COUNT)      ;UPDATE ROW COLUMN COUNTER
408F          AND A             ;AND CHECK TO SEE IF END OF
4090          INC A             ;ROW YET.
4091          LD (£B085),A      ;
4094          LD B,A            ;
4095          LD A,(£B0B0)      ;
4098          CP B              ;
4099          JR Z,UPDVDP       ;UPDATE VDP ROW COUNTER.
409B          JR PSEND          ,NOT AT LINE END YET.
409D UPDVDP:  PUSH DE           ;MOVE VDP ON BY 40 (SCREEN
409E          LD DE,40          ;WIDTH).
40A1          ADC HL,DE         ;
40A3          POP DE            .
40A4          PUSH HL           ;
40A5          XOR A             ;
40A6          LD (£B085),A      ;ZERO F7 COL COUNTER.
40A9          JR VDPSET         ;
40AB LF:      DB 27,"A",16      ;SET PRINTER SPACING.
40AE          DB 27,'8'         ;SET COLUMN
40B0 COL:     DS 1              ,WIDTH
40B1 SCRNRT:  DS 2              ;£80B1
40B3 LENPAN   DS 2              ;£80B3
40B5 COUNT.   DS 1              ;£80B5
40B6 END:     LD B,13           ;SEND CR.
40B8          CALL £0CE3        ;
40BB          LD B,10           ;SEND LF.
40BD          CALL £0CE3        ;
40C0          RET               ;RETURN TO PANEL EDITOR

20 CODE

MOVECODE: LD HL,£4007           ;(OR £8007) START OF CODE.
          LD DE,£8007           ;NEW LOCATION IN MEMORY.
          LD BC,186             ;LENGTH OF CODE TO MOVE.
          LDIR                  ;MOVE IT
          RET                   ;

30  RETURN
100 USER SAVE "PANEL.COD"
110 GOSUB 20
120 RAND USR(45063)
130 NEW
```

Evaluates

Adam Wright

This routine for the Commodore 64 will give it an *Eval$* type command. It is much the same as the command used on the BBC.

The syntax for the command is as follows:

Sys 49152, string to be evaluated, variable to return result in

```
0 REM EVALUATE$
1 DATA 32,253,174,32,139,176,166,13
2 DATA 200,3,76,72,178,160,2,177
3 DATA 95,200,3,76,72,178,133,251
4 DATA 200,177,95,133,252,200,177,95
5 DATA 133,253,162,3,160,0,177,252
6 DATA 157,64,3,232,200,196,251,208
7 DATA 245,169,0,157,64,3,32,253
8 DATA 174,32,139,176,166,13,240,3
9 DATA 76,72,178,165,69,141,64,3
10 DATA 165,70,208,2,169,32,141,65
11 DATA 3,169,61,141,66,3,166,251
12 DATA 232,232,232,160,0,185,64,3
13 DATA 153,0,2,200,202,16,246,165
14 DATA 122,133,254,165,123,133,255,169
15 DATA 0,133,122,169,2,133,123,32
16 DATA 121,165,32,115,0,32,237,167
17 DATA 165,254,133,122,165,255,133,123
18 DATA 96
20 EV=49152:CK=0:FOR A=EV TO EV+136
30 READ D:POKE A,D:CK=CK+D:NEXT A
40 IF CK<>17478 THEN PRINT "ERROR":STOP
50 INPUT "EQUATION ";E$
60 SYS EV,E$,A:PRINT "RESULT = ";A

READY.
```

Bank Account

Alastair Scott

This short program for the Amstrad CPC 6128 allows four Basic programs of less than 16k each to be stored in the extra banked Ram. To store a program load it and type *Put x* where x is the bank number (0–3). To retrieve it type *Get x*.

Avoid using addresses &4000 to &7FFF as they are used by the bank switching.

```
100 Basic programs in extra 64K
110 by Alastair Scott
120 CLS:FOR a=&BE80 TO &BEE3
130 READ b$:POKE a,VAL("&"+b$)
140 NEXT:CALL &BE80
150 PRINT"Use 'PUT,x' and 'GET,x'."
160 DATA 01,A9,BE,21,E0,BE,C3,D1,BC,91
170 DATA BE,C3,98,BE,C3,BC,BE,50,55,D4
180 DATA 47,45,D4,00,3D,C0,DD,7E,00,C6
190 DATA 04,CD,5B,BD,21,70,01,11,00,40
200 DATA 01,90,3E,ED,B0,21,00,AE,11,90
210 DATA 7E,01,70,00,ED,B0,AF,C3,5B,BD
220 DATA 3D,C0,DD,7E,00,C6,04,CD,5B,BD
230 DATA 21,00,40,11,70,01,01,90,3E,ED
240 DATA B0,21,90,7E,11,00,AE,01,70,00
250 DATA ED,B0,AF,C3,5B,BD,00,00,00,00
```

Neatlist

Alastair Scott

With this Amstrad CPC routine you can emulate the BBC's *Listo* command. After running the listing use:

F1 turns *Neatlist* on. In this mode all statements separated by colons will be placed on separate lines and the textual parts of the program will be justified.

F2 returns to the normal *List* format.

F3 Lists a program.

```
100 Neatlist
110 by Alastair Scott
120 MODE 1:MEMORY &99FF:f$=CHR$(13)
130 FOR a=&9A00 TO &9A7D
140 READ b$:POKE a,VAL("&"+b$)
150 NEXT
160 PRINT"f1-Neatlist on f2-Neatlist off f3-list."
170 KEY 129,"IF PEEK(&B85A)=&CF THEN CALL&9A00"+f$
180 KEY 130,"IF PEEK(&B85A)=&C3 THEN CALL&9A18"+f$
190 KEY 131,"CALL&B0FF:CALL&B94E:LIST"+f$
200 DATA 2A,5B,B8,22,1A,9A,AF,32,41,9A,F5,3E
210 DATA C3,32,5A,B8,21,26,9A,22,5B,B8,F1,C9
220 DATA F5,21,00,00,22,5B,B8,3E,CF,32,5A,B8
230 DATA F1,C9,C5,D5,E5,32,73,9A,FE,22,20,0C
240 DATA 3A,41,9A,EE,FF,32,41,9A,3E,22,18,25
250 DATA FE,3A,20,21,06,00,C8,78,20,1B,CD,18
260 DATA 9A,3E,00,CD,5A,BB,3E,0A,CD,5A,BB,06
270 DATA 04,3E,20,CD,5A,BB,10,F9,CD,0A,9A,18
280 DATA 19,CD,18,9A,CD,78,B8,7C,FE,26,38,03
290 DATA 2C,26,05,CD,75,BB,3E,00,CD,5A,BB,CD
300 DATA 0A,9A,E1,D1,C1,C9,00,00,00,00,00,00
```

We want your programs!!

Yes this is your chance to get rich and famous. Well famous any way as *Popular Computing Weekly* is looking for contributions to the Programming pages.

What sort of thing are we looking for? You name it – anything original from games to utilities, applications and the like written in Basic, machine code or anything else you can think of.

Programs for any computer will be considered, not just the old faithfuls (Spectrum, Amstrad, QL, Commodore etc) so send those listings in. What we need is a working copy of the program on tape or disc plus an accompanying article or documentation that you would anticipate going with the piece, normally not over 2000 words.

Alternatively, send in your short programs to the Bytes and Pieces page – what could be easier?

In return, we'll pay the princely sum of £25/page for the main programming pages and £10 for each Bytes & Pieces contribution we publish. Plus the fact that your name will be indelibly carved in the *Popular* Programming Hall of Fame till time immemorial. What more could any true programmer ask?

Just send your masterpieces in to **Duncan Evans, Technical Editor, Popular Computing Weekly, 12–13 Little Newport St, London WC2 7PP** and he'll assess them post haste.



with Kenn Garroch

Recording from Amstred

John R Grigney of Cold Norton Chelmsford writes

Q **I am an Amstred owner, specifically the CPC464. In my spare time I do a little composing (music that is), using the disc version of Rainbird's *Music System*. The problem is that I want to record the music that I've written, so that my friends, relatives etc, can listen to it on cassette.**

I have tried using the Amstrad's own ear socket, by connecting it to a cassette using an ex-Sinclair networking lead, connected between the ear socket on the Amstrad and the mic socket on the tape recorder. This method was somewhat successful, but at the loss of the alto part of the music and some of the bassline. This, I think, is mainly due to the fact that I am trying to connect a stereo socket to a mono socket.

Is it possible to connect the Amstrad CPC range machine via the ERA socket to mono cassette recorder and lose nothing? Or does there have to be an amplifier used before this can be done? (If there does then bang goes my chance of getting an ST.)

A Yes you can connect the Amstrad's ear socket directly to the mic socket of a tape recorder. Connect up the lead as in the diagram. You will need a 3 5mm stereo jack and whatever your tape connection plug is. In the picture I've assumed this to be a 3 5mm mono jack. All you need to do is connect the left and right channels together.

The reason it does not work when using a mono plug in the Amstrad can be seen when you look at the difference between the mono and stereo plug designs. Using a mono plug connects the right channel to ground thus losing it completely plus half the centre channel is put through the right for stereo so you lose that as well.

Sorry about the ST but perhaps you can get one anyway.

The missing MSX Link

Mark Morrison of Pollock Glasgow writes

Q **I am writing to you to reply to Derek Patterson of Largs, Scotland, to let him and anyone else who is interested in upgrading their MSX 1 to MSX 2. I am a member of MSX Link and last month we had an article in the mag about the MA ZO upgrade kit. It provides the following:**

Nine screens, 128K Video Ram, RGB, composite video, and RF output, built in battery backed clock, 80 column display, full MSX 2 Basic commands, Ram disc facility.

The extra Basic commands give access to the new facilities. The only problem is that the MSX machine must be a 64K model, otherwise forget about upgrading.

The price of MA.ZO is £99 99 plus £5 p and p. If you wish to purchase one contact Karl Kneff UK, 63 Newhall Road, Leeds LS10 3RX.

If you would like to join MSX Link, get in touch with MSX Link, c/o David Webb, 11 Ayscough Avenue, Spalding, Lincs, 0775 3433.

A Thanks for the help Mark. I hope this is of use to Derek Patterson and any other interested parties.

Connecting with Mannesman

Paul Dixon, of Wincanton, Somerset writes

Q **Do you know if I can use a Manneseman Tally Spirit 80 printer with my Atari ST? If so, can I purchase a suitable lead, or will I have to make one up myself?**

A The Spirit 80 is a pretty standard Epson compatible and I presume yours has a Centronics interface. If so you will be able to attach it to the Atari with the appropriate lead.

Most Atari suppliers stock a Centronics lead for the machine – it should cost you about £15 £20. If you can make one for less then you may as well.

All you need are two connectors: a 25 way D type plug (to match the picture) and a 36 amphenol plug an 18 way ribbon cable.

The connections you need to make are only those shown in the ST connection. The Centronics connection has quite a number of options that can be ignored. The ACK is not used by the ST neither are the paper error auto feed init error and slot in.

Keeping tabs on Citizen

Stephen Kirk of Morley Leeds writes

Q **I recently bought a Citizen IDP-560 printer (the small till roll beast) to use with my C64. One of the jobs I use the computer for is monthly sales figures. Previously I had been displaying the tabulated data on screen using the TAB(X) command to keep the columns tidy.**

The 'on screen' TAB always counts from the first column irrespective of previous entries on that line.

However, I find that the printer tabulates from its last printer head position. I cannot use space as the individual table elements can vary from one to six figures in length. How do I get neatly aligned data columns using the printer?

A I am no expert on the Citizen IDP 560 so I can only give you a few ideas. A printer usually tabs, as you say, by receipt of a tab command (Ascii 9) moving the carriage to the next tab position. The TAB(X) command moves the screen cursor to the column number given by X measured from the start of the screen.

One way around this problem may be to insert carriage returns (Ascii 13s) before each tab sent to the printer. The carriage would then always tab from the start of the line.

continued on page 30 ▶

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Kenn Garroch and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, PCW, 12-13 Little Newport Street, London WC2N 7PP.


L A S T

◀ continued from page 27

The only problem with this is that the printer may take a carriage return to mean both move to the start of the line and then do a line feed If this is the case with the Citizen then this method will not work An alternative is to mimic the TAB command on the C64 for the printer ie

```
1000 REM NUMBER TO BE PRINTED IS N N / X IS THE POSITION
1010 FOR T=1 TO X
1020 PRINT CHR$(32)
1030 NEXT
1040 PRINT N
1050 RETURN
```

Use GOSUB 1000 with X containing the position and N the number This does left justify the numbers but not the decimal points You will have to alter the subroutine to convert the number to characters look for the dp and then position accordingly

Another way of looking at the problem is to ignore the screen layout and format the printer output separately To do this you will need to output the numbers in the sequence – they will be printed across the paper Once this is done print them out separated by tabs and they should all be lined up

Hopefully one of the above possibilities will work

Misunderstood errors

George M Stephen of Blyth Northumberland writes

Q Could you or anybody help me with a problem? I went to the local library and got out a book called *The Amazing Amstrad Omnibus* and decided to type in a game called Dominoes After typing it in I ran it and up on the screen came Line Does Not Exist in 80

So I typed in the line again which read 80 GOSUB 1750 REM INITIALISE and the same thing happened again So instead of running the tape back to the beginning I started it from where it stopped and on the screen came Unexpected Next in 420 So I typed in 420 NEXT J and as before, the same thing happened.

My computer is an Amstrad CPC464 I hope you or any other Amstrad user who has a copy of this book can help me out The game is on page 235 and ends on 241.

A You seem to be misunderstanding the computer error messages somewhat The line does not exist error means that the program is looking for a line number after a GOTO or GOSUB command (the latter in this case)

After seeing this error list the line in which it occurs and see which lines are trying to be found Then list these in this case LIST 1750 If it does not appear then you haven t typed it in so crossref against the listing in the book

By following the error messages it is usually possible to take out most of the more obvious typing errors (everybody makes typing errors it s what keyboards were invented for)

The second thing you seem to have misunderstood is that after typing in a program you should save it Saving a program puts everything you have typed in on to cassette If you have only typed in part of the program you can save that part but it won t run properly until all of the program is in the computer

To attach the rest of the program load the first part and continue entering lines from where you left off Saving now saves more of the program and the process can be repeated until the save saves the whole program

It may be that you have the time to type in the whole program in one go in which case save it when you have finished The next step is to get rid of the bugs (including typing errors) and then save it again as the final version You cannot load the program in sections, unless they are being chained together but this is unlikely in this case

The second error you found is due to there being a NEXT without a FOR The computer expects every NEXT to have been preceded by a FOR and there should be an equal number of both in the program FOR NEXT loops can be nested eg

```
FOR T=1 TO 100
FOR S=2 TO 5
PRINT S T
NEXT S
NEXT T
```

Note that the NEXT for the S comes before the NEXT for the T ie one loop is inside the other You have probably missed out a line with FOR on it somewhere while typing it in Look for FOR J= etc in the book listing and check the program to see if it is there

It is possible that the publishers have printed an erroneous listing and although this is unlikely it has been known to happen If you have checked all the lines and the program is still chucking up errors contact the publisher and ask whether there is an errata sheet available If you get one you may as well give it to the librarian who can attach a copy in the book for other readers to use

Adding up the figures

L Saunders of Tarporly Cheshire writes

Q I have noticed that my computer, running Basic, only allows arithmetic with variables of limited numbers of digits Is it possible to make the machine perform arithmetic functions on larger figures? If so, how is it done?

A Normally integer numbers are stored inside the computer as 16 or 32 bits depending on the version of Basic To get larger numbers the most efficient method is to resort to machine code However it is possible to use machine code techniques in Basic with decimal numbers Using the methods described below the only limit on the size of a number is the amount of memory available to store it

A normal 16 bit variable is allowed values between ±32767 To get larger values each integer is limited to a value between 0 and 999 to allow for carries For the examples given here I ll ignore negative representations

Large numbers are created in arrays of numbers each having a value from 0 to 999 So the first value array %(0) is 0–999 (The % symbol after a variable denotes a 16 bit integer) the second 1×1000 to 999×1000 the third up to 999×1000000 and so on The first routine needed is a way of printing these on screen

The Basic program shown doesn t use line numbers it has labels instead To convert it to line numbers put one before each line and substitute the appropriate line numbers for the labels (a word followed by a colon eg *mprint* is a label) The *mprint* subroutine takes the 33 digit numbers in the array d% and prints it onto the screen by taking the right most digit and placing it into a string followed by the next right etc

Spaces are put into the string after every third digit to make the number readable Next come the arithmetic functions *madd* and *msub* The addition is performed in a similar way to written addition

After each element of the array has been added to its corresponding element a carry is generated from the fourth digit This is then added into the next sum in c% This process is performed for the whole array giving a multiple precision addition

The subtraction is done in a similar way to the addition the only difference is that the carry becomes a borrow Again it is the same as though it were being done on paper except that each element in the array is accessed as though it were one digit

The only oddity of the subtract subroutine is that if the answer is negative the numbers are switched and the *mi* variable set to one to indicate a negative result

The final routine is a multiple precision multiply Since two 16 digit decimal numbers produce a 32 digit number when multiplied only 16 digits are allowed in the number doing the multiplying The routine is split up into subsections since 1) it is easier to understand and 2) it was easier to write this way When multiplying two numbers with the method sometimes known as long multiplication the following takes place

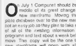
```
  ABCD
×   EF
E×ABCD×10
+F×ABCD
```

The tens are multiplied first with the answer being times ten followed by the digits These two results are added up to give the answer So one of the numbers being multiplied shifts left (is times ten) and the other shifts right and the least significant digit (units) is used for the multiply

Compunet to move in July

At the beginning of next month, Compunet will be switching over to a new mainframe. And, as Graham Edkins reports, it could be the start of great things

On July 1 Compunet should be in the middle of its great change to the new mainframe. Moving the complete database over to the new machine is not an easy job so they plan to take a copy of all of the existing information, users' programs and text about a week before the move. This copy will be the one that the new mainframe will open with after the conversion.



"These changes will move Compunet from being a hugely popular C64 network to being a real force in the world of micro databases"

The new online code is written in C. Once any inevitable small bugs have been ironed out it will run a very much faster and improved service on the new mainframe which has been custom designed for the specific needs of this service. It runs on 68020 processors, each being dedicated to a single task such as getting a directory or showing a page, thus avoiding the slowness caused by users' commands having to wait their turn when a single processor handles all of the tasks. Compunet have described this as a multi-task multi-threaded software design having a VME architecture.



ERW7's contribution to the Compunet files

Apart from speed another advantage with this layout is that it has virtually limitless scope for growth. Initially the new system is double the capacity of the old but when more processing power is needed as more people join the network it can be increased by upgrading to whatever is at the time the latest processor in the 68000 series. Alternatively more of the same can be patched on.

Until now Compunet's problem has been accommodating all those who wished to join. Now they will be able to grow with demand and allow other micros online when they wish. Among the obvious contenders to break the mould of the dedicated single micro system are the Atari ST and the PC compatibles. Since the BBC micro was mooted as the first non Commodore to be given access quite a long time has passed and this may not seem such an obvious choice now.

When you log on to the new mainframe it will look the same as always, maintaining its directory structure, command duckshot headings, alpha gotos and function key movements. In fact you will not even have to download a new version of the access code.

Initially the long standing multi user game *MUD* will not be available but once everything is running smoothly the in-house written game *Federation II* will come on line. There will also be another (as yet undisclosed) game available. The connect charge levied for weekday daytime use will be halved and certain users may have to use a different local access node to log on.

These changes will move Compunet from being a hugely popular network for Commodore 64 owners to being a real force in the world of micro databases. Currently many people use it as a base for clubs or sigs (special interest groups).

An example of how these can be put to good use is in the communications directory. If you GOTO MICRON you will arrive in an area where Bulletin Board sysops who use the Micron host software (myself included) have joined together informally to promote their boards and pass on information. There is a directory listing all of the boards running, their opening times and phone numbers, another directory holds the free downloadable access software and there are also areas for the users to upload questions or problems and for sysops to exchange help or information.

This Micron area is not run by any one but it simply maintains itself with the users' uploaded frames keeping it alive, but without this area the sysops would be unlikely to be in contact with each other. They would most probably be competing with each other for users of their boards but as it is they work together making their boards more widely used as a whole.

The Independent Commodore User Group (GOTO ICPUG) uses Compunet as one of its ways of communicating with both members and non members. In ICPUG's directory there is a sub-directory for non members which has free programs, information and membership details, while in the Closed User Group (CUG) which members can enter it has most of its library of Commodore 64/128 public domain programs available to download, group details, help areas and even another CUG for committee members.

For most users though it is the vast array of free programs which attracts them to Compunet. The Hall of Fame which is an area used by Compunet to hold the most outstanding of these programs has a new directory especially for free games (GOTO FREEBY). As this is a recent addition it is currently smaller than the more established parts of The Hall of Fame but you will find *Freak out* by Master *Cybertrap* by ID2, *A Load of Balls* by Hagar and a couple from Ubic including his *Nostalgia Trip* program which is a nice simple space invader game the like of which are sadly scarce in these days of highly sophisticated games software.

RS16 who has a program in the Freeby directory also has his own area in the Jungle. GOTO ROS and you will be rewarded with a selection of free games, demos and utilities which include an 80 column terminal emulation program, an assembler and a game called *Omniopoly* as well as a demo which is very honestly called *Nicked Music*.

THE SENSIBLE WAY TO EDIT ON THE ST

Mark Jenkins reviews the Soundbits Voice Master to use when editing with the Atari ST

Over the last few weeks I've mentioned the usefulness of computer based editing packages several times. The main reason for their development has been the cost-cutting measures introduced by synth manufacturers – which largely take the form of leaving the knobs off synthesisers.

Anyone who owns a Casio CZ101, a Yamaha DX100 or a Roland Alpha Juno synth will realise that editing sounds using a single control – the data entry slider on the Yamaha, the value buttons on the Casio or the Alpha Dial on the Roland – can be an arduous task. To their credit Roland do supply optional programmers – control panels with a complete set of parameter knobs – for most of their synths but these units cost a couple of hundred pounds and have no equivalent in the Casio or Yamaha catalogues.

Sound editing using a micro makes sense particularly if you're already using a micro as a sequencer. It can also help you to build up a library of sounds which would otherwise have to be laboriously saved to tape or to expensive cartridges. In most cases it will also allow you to name your sounds, which you can't do on the Casio, for instance.

The latest synths to be aided by a micro editing package are the Roland Alpha Junos – the Alpha Juno 1 is a compact six note polyphonic analog design and the Alpha Juno 2 has a longer keyboard and features velocity and pressure sensitivity. The new package, the latest in the Voice Master series, is on the Soundbits label for the Atari ST and is being distributed by Syndromic Music; at the same time they've released an editor for the Yamaha TX81Z, which is a rack mounting eight note multitimbral FM synth. Unlike the earlier FB 01 module, the TX81Z can be edited, but its handful of controls don't make this a straightforward task.

Soundbits is also about to market an editor for the Roland D50. This is a rather more upmarket synth costing £1400 or so which works using a system called Linear Arithmatic Synthesis. In practice this means that the attack phase of each sound is digitally sampled, with 100 different samples available, but the sustain portion of the sound is synthesised. The result is an instrument which has all the power and conviction of a sampler but all the editing ability and performance control of a conventional synth.

The editing routines for LA Synthesis sounds are pretty complex and involve a complex set of controls (on an optional programmer) plus a joystick on the synth itself which varies the proportion of various components of the sound. Clearly an editor is going to be pretty useful here – the synth itself is causing enormous waves and everybody who hears one seems to want to buy one!

Soundbits Voice Master for Alpha Juno ½ and Atari ST: the Library Page.

Back though to the Alpha Juno editor, which opens with a straightforward table of sound parameters including the synth's waveform, pitch, envelope, LFO and Chorus settings. The sound name is displayed at the top of the screen and this is shown as 'Undefined' until you load a sound either from the built in library or from the synth itself.

The File option allows you to save individual sounds or whole banks of sounds to disc, while the Juno option allows you to decide whether you're dealing with a single sound or whole banks of sounds. You can Print out a parameter list or go to the Graph option to display a particular envelope.

The envelope display is a simple five stage chart of level against time, and you can use the mouse to drag small red boxes marking the end of each stage to new settings. On the review copy it was a little difficult to get hold of these boxes but we understand this will be tidied up on production versions. Certainly it's handy to be able to set an envelope without typing in a lot of individual parameter settings.

The Library option offers two banks marked A and B each comprising 64 voices, of which 32 are listed at any one time. The built-in library includes such efforts as Wobbleclick, LongString, Softbell and so on, and these of course are a valuable bonus over and above the sounds which come provided with the synth. If you haven't heard the Alpha Juno you'll be pleased to learn that it's quite a versatile machine, capable of fairly rich, fat analog sounds and also some cleaner digital effects thanks to a large variety of waveforms and a useful chorus.

The final sections of the Editor labelled Detail let you see the parameters for the DCO, VCA and VCF in greater depth. Waveforms are displayed in icon form and you can enter new values for the aftertouch depth, noise level and other parameters. There's also a clever Blend function which allows you to create an average of two sounds; you can set the Blend control to any point between two and produce a string sound with a touch of the percussion of a vibes setting, or a violin with some of the random elements of a totally abstract sound.

The Test routine allows you to sound any one of four different chords or a constant note should you be editing a keyboardless Alpha Juno module (or indeed be using your computer on one side of the studio while the synth is on the other).

Overall the Soundbits Alpha Juno editor is everything any owner of the synth could want, and clearly a good alternative to buying the expensive programmer unit should you already have an ST and be interested in building up a large library of sounds (and who isn't?).

In the next few weeks we'll be looking at more software from the Soundbits range.

If you have any queries or tips for this column please write to Mark Jenkins at *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP. Mark would also welcome examples of your own music on audio or program tape, or disc.

MICRO-FILE

SOFTWARE

ADVERTISING RATES FOR MICRO-FILE

Semi Display £8 per single column centimetre (+VAT)
Lineage 35p per word (+VAT)

CALL SUSANNAH KING on 01-437 4343 FOR SEMI DISPLAY ADVERTISING

SOFTWARE

STORT SOFT

MAIL ORDER SPECIALISTS

INCREDIBLE LOW PRICES!

ALL DISKS CARRY A NO QUIBBLE REPLACEMENT GUARANTEE, ARE CERTIFIED 100% ERROR FREE & COME WITH LABELS. 5¼" ALSO HAVE SLEEVES & WRITE PROTECTS AND REINFORCED HUB RINGS

BLANK 5 1/4" DISKS

DISK NOTCHER FREE WITH EACH 100 DISKS PURCHASED

UNBRANDED	TRIAL 10	25	50	100	10 in a plastic lib. case
SS48 TPI	£4.50	£9.00	£17.00	£33.00	£5.50
DS48 TPI	£5.50	£11.00	£19.00	£36.00	£6.50
DS96 TPI	£6.50	£13.00	£21.00	£37.00	£7.50
DS96 TPI FLIP SIDED	£7.00	£14.00	£22.00	£38.00	£8.00
MAXIC FLIP SIDED DS96 TPI	£8.95	£20.00	£38.00	£70.00	£9.95
MAXIC HIGH DENSITY					
1.6meg	£25.00	£52.00	£100.00	£180.00	£24.00
COLOURED mix & match or all one colour					
SS48 TPI	£6.50	£12.00	£22.00	£42.00	£7.50
DS48 TPI	£7.50	£14.00	£24.00	£44.00	£8.50
DS96 TPI	£8.00	£18.00	£28.00	£50.00	£9.00

SPECIAL PRICE Dysan DS48TPI BOX OF 10 ONLY £18.95

BLANK 3 1/2" DISKS

	10	25	50	100	10 in a plastic lib. case
MF1DD (SS/DD)	£12.95	£30.00	£58.00	£115.00	£13.95
MF2DD (DS/DD)	£14.95	£36.00	£63.00	£125.00	£14.95

LOCKING DISK BOXES

5 1/4" HOLDS 40	£7.95	3 1/2" HOLDS 80	£9.95
DD 90 HOLDS 80 3" or 90 3 1/2	£9.95		

BLANK 3" DISKS

	10	20	50	100
CF2	£25.00	£40.00	£110.00	£200.00
CF2DD	£33.00	£80.00	£160.00	£300.00

LOCKING DISK BOXES

5 1/4" HOLDS 50	£7.95	5 1/4" HOLDS 100	£9.95
3 1/2" HOLDS 40	£7.95	3 1/2" HOLDS 80	£9.95
DD/90 HOLDS 80 3" or 90 3 1/2	£9.95		

COMPUTER ACCESSORIES

5 1/4" DISK NOTCHER (Double your disk capacity on a single sided disk)	£9.95
DISK CLEANING KITS Liquid non-abrasive type protect your valuable software	
5 1/4" DCK £3.95 3 1/2" DCK	£4.95
ST/IBM/AMSTRAD 1512 TO CENTRONICS PRINTER LEAD (2 metres)	£9.95
ST TO RS232 MODEM LEAD (2 metres)	£9.95
BATTERY POWERED MINI VAC – for keyboards, printers etc	£9.95
QUICKSHOT II + (microswitch) joystick	£9.95

COMPUTER STATIONERY

PRINTER PAPER Continuous fan fold, sprocket fed

SHEETS	11"x 9.5" 60gsm	A4 70gsm	11 x 9.5" 80gsm	A4 80gsm
500	£4.00	£5.95	£9.00	£8.00
1000	£6.00	£10.95	£14.00	£15.00
2000	£13.95	£18.50	£24.00	N/A

LABELS Continuous fan fold, sprocket fed

	70mm × 36mm	89mm × 36mm	101mm × 36mm	38mm × 89mm
1000	£4.15	£4.25	£4.50	£5.75
2000	£7.50	£7.90	£8.40	£10.50

Please specify number of labels across (1, 2 or 3)

SUMMER STAR VALUE UNBELIEVABLE BARGAINS

520STM SF354 ½ MEG DISC DRIVE MOUSE & 1st Word WORD PROC	£344.95
520STM SM125 MONO MONITOR SF354 ½ MEG DISC DRIVE MOUSE 1st Word WORD PROCESSOR	£434.95
520STM SF314 1 MEG DISC DRIVE MOUSE & 1st Word WORD PROC	£378.95
520STM SF314 1 MEG DISC DRIVE SM125 MONO MONITOR & 1st Word WORD PROCESSOR	£508.95
520STM (½ MEG RAM)	£249.95
520STM (1 MEG RAM)	£349.95
520STFM + (½ MEG RAM ½ MEG DRIVE AND MOUSE)	£379.95
520STFM + (1 MEG RAM ½ MEG DRIVE & MOUSE)	£479.95
1040STF (1 MEG RAM 1 MEG DRIVE & MOUSE)	£569.95
520STFM & SM125 Hi RES MONO MONITOR	£478.95
1040 STF & SM125 HI RES MONO MONITOR	£658.95

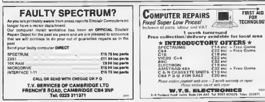
All Hardware comes with free dust covers! All STs come with 5 public domain disks including CPM emulator and the arcade game Megaroids. 5 Blank disks to get you going. Basic language [illegible] and manuals

Just write for more information. Cheques etc. payable to STORT SOFT (International orders add 10% and remit in pounds Sterling by bank draft or intl. money order. Write for quote in any other currency.)

ACCESS/MASTERCARD/EUROCARD/VISA accepted CREDIT CARD ORDER LINE – 0279 89509
24 HOURS A DAY, 7 DAYS A WEEK – NO HIDDEN EXTRAS – WHAT YOU SEE IS WHAT YOU PAY

18 CROWN CLOSE, SHEERING, BISHOP'S STORTFORD, HERTS CM22 7NX

SERVICES





THE COMPUTER DEPOT
205 Buchanan Street
Glasgow G1 2JZ
041 332 3944

USED GOODIES

Amstrad 8256	£300
BBC	£225

☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆

Timex Printer for Spectrum
£14.95
Paper Rolls 95p

☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆

SCOOP PURCHASE
12" Green Monitor
Ferguson MM02

★ **ONLY** £49 95 ★

Suitable for Commodore BBC Electron IBM Amstrad PC Spectrum Atari etc (specify type of lead)

A veritable Aladdin's cave for the computer lover
Visit or telephone

BLANK CASSETTES

[illegible]

	C10	C15	C20	C30
20	7 50	7 70	7 90	8 70
50	18 00	18 20	18 90	18 50
100	28 00	30 00	31 00	36 00

Fully inclus. inc C O D [illegible]

DISKS

10 5¼ DS/DD £6 50 inc case
10 5¼ SS/DD £16 inc case
10 3" AMSOFT £25 inc case

MEMOTECH COMPUTERS AND ACCESSORIES

MTX 512 COMPUTER	£65 00
DMX 80 PRINTER	£150 00
RS232	£35 00
PASCAL ROM	£35 00
SPECULATOR ROM	£35 00
1mb DISK DRIVE & INTERFACE	£170
1mb DISK DRIVE & INTERFACE	£175

All the above prices are fully inclusive. We stock the entire Memotech Range. Order/Enquiries to

UK HOME COMPUTERS
[illegible]
24 hr Phone Service 0785 695034

DISCS

3" per 10

AMSOFT CF2		£28 95
AMSOFT CF2 IN PRINTED BOX		£31 95
3·5" per 10		
MAXELL MF1DD		£22 43
MAXELL MF2DD		£32 63
SONY DD440		£19 00
SONY D1440		£32 90
VERBATIM MF350		£19 50
UNBRANDED (GUARANTEED)		£16 15
UNBRANDED (LIFETIME)		£16 95
5·25" per 10		
MAXELL MD1D		£12 25
MAXELL MD2D		£14 95
VERBATIM MD250-01		£12 95
VERBATIM MD525-01		£12 95
VERBATIM MD550-01		£16 69
GOLDSTAR RPS		£8 95

All discs cert. 100% error free and are guaranteed for life. [illegible]
All prices inc. VAT and P&P [illegible]

RUGBY MICRO SPARES
30 OXFORD ST, RUGBY
CV21 3NF (0788) 71643
Telex 312242 MIDTLXG

FREEZE WE'VE GOT YOU COVERED
DUST COVERS
For all computers and equipment

- ★ 100% washable proofed nylon, static inhibited in a choice of 5 colours to suit you red, blue green, black grey
- ★ Stylish contour design, piped in a contrasting colour
- ★ Huge range eg Atari St (M) (FM) 1040 (STF) 4 piece set just **£10 50**
- ★ Below just some of the machines we cater for
- ★ Atari ST range 4 piece set – **£10 50**
- ★ Amiga 4 piece set – **£10 95**
- ★ PC 1512 3 piece set – **£9 00**
- ★ PCW range 3 piece set – **£8 95**
- ★ CPC range 2 piece set – **£8 00**
- ★ Commodore C64 1 piece – **£3 50**

Also covers made to your specification for any computer or device Write or phone for details

Please state make and model numbers of computer, monitor and printer and disc drives

Stop Press Latest offers on 3·5" blank discs 5S DD 135TPI 10 for **£13 90** inclusive of P&P Postal orders and cheques made payable to

Concept Covers, 24 Wolstenbury Road
Rustington, West Sussex BN16 3LB
Tel 0903-782945

AMIGA
PUBLIC DOMAIN SOFTWARE

[illegible]

George Thompson Services Ltd.
Old Reigate Road
Betchworth Surrey RH3 7NR
Tel 073 784 4075

AMIGA
Amstrad Oric/Apmos

Super Selection of Software for sale and hire
Send S A E (stating make of computer) to

The Software Club
26 Beechley Drive
Cardiff CF5 3SN

Atari 800 XL / 130 XE
Essential Utilities

Transdisk Version 3 0
[illegible]

The Freezer!
[illegible]

DIGICOMM
[illegible] Milton Keynes, Bucks MK13 [illegible] Tel [illegible]

SPECTRUM 48K Lo-profile keyboard £50 Spectrum Plus 2 new boxed £120 Discovery disc drive (faulty) £30 joystick and printer interface £5 each Software including Tasword Artist 2 Studio Tel 0474 325151 evenings

DRAGON Basic listings printed Send cassette/disc S A E and £1 to Andrew Davies 49 Badgerwood Glade Wetherby W Yorkshire LS22 4XR

AMSTRAD CPC 464, colour monitor disc drive Multiface 2 40 games on tape and disc DK tronics TV modulator joystick magazines £300 Tel Paul at 01 871 2643 after 5pm

ATARI 520STM+, 1Mb high res monitor Cumana double 1Mb disc drive Star NL 10 dot matrix printer magazines software Great for word processing hardly used real bargain at £760 Tel 01-656 4488 evenings

AMSTRAD CPC6128, sound sampler speech synthesiser stereo speakers Amdrum mouse 10 blank discs over £300 software joystick books and magazines Sell for incredible £400 Tel 0232 618479 Ask for Daniel

AMSTRAD disc drive DDI1 12 blank discs £70 00 Disc software Illustrator G A C Inside dr Pilot Tomahawk Elite L O M Tau Ceti £40 00 Mirage Imager £2500 The lot £125 Tel 0602 616275

SPECTRUM 48K Elite Kyord Centronics E printer interface £400 S/ware including Silent service F15 Eagle Bamarck Short Circuit PS1 5 Enduro Racer Academy All manuals first reasonable offer secures Tel 01 727 6184

COMMODORE 64, MPS801 printer 1701 colour monitor cassette drive £300 Software books = complete computing system cost over £950 sell for £410 o n o All mint condition Tel Medway (0634) 406527

ATARI 130XE, 1050 drive 1020 printer touch tablet cassette joysticks compiler + 100s of games and utilities on disc cassette Rome all originals boxed Worth £1400 sell £370 o n o Tel (0924) 523355

ATARI 520ST half meg drive Loads of software inc Pawn Stargilder MCC Pascal dust covers books mags discs monitor not inc Cost £1000 sell £400 o n o Tel Adrian 0656 738884

BBC B computer Watford D F S disc drive cassette monitor thermal printer software plus computing step by step books £450 complete Tel 01 573 5634 evenings

COMMODORE 64, 1514 disc drive daisywheel printer C2N data cassette joystick interface and assorted software including word processor package £350 (will split) Tel 01-436 7714

ATARI 800 with Ultimon 810 drive Happy 1010 recorder 1020 printer plotter 150 + discs Over 700 programs books + mags Only £210 complete system Tel 01 848 8384

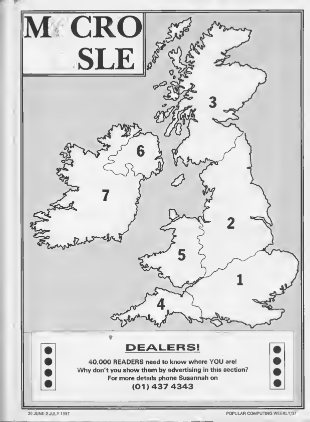
MEMOTECH MTX512 64K DMX80 printer word processor Eeesm utilities games software cables manuals and many books £200 00 the lot Tel 0695 420364 after 6pm o n o

ATARI 520STM, colour monitor 1 meg drive fast basic Art Director 30 games inc Star Glider Star Raiders Goldrunner Guild of Thieves Infocoms £550 Tel Chris Witney 5382 Buyer collects only

BOXED 128K ZX SPECTRUM and twelve games £60 o n o For urgent quick sale Tel 0942 603507 evenings

STIX THE MAGAZINE FOR ATARI ST USERS Independent and different And new concepts introductory offer £1 20 inc P&P Cheques and POs to Stix 72 Main Street Osgathorpe Leicester LE12 9TA

FOR SALE MACKINTOSH 512K only £700 and new boxed Apple 800K external disc drive £300 Sell together for £800 Tel (01) 609 3404


M CRO
SLE
3
6
7
2
5
1
4
DEALERS!
40.000 READERS need to know where YOU are!
Why don't you show them by advertising in this section?
For more details phone Susannah on
(01) 437 4343

2 MIDLANDS AND NORTHERN ENGLAND

WHITBY

ATARI ST original software around half price. Send for lists to Jervis, 18 Porren Drive, Nottingham NG5 5OT or Tel (0602) 274360

I WOULD LIKE TO get in touch with other AMIGA owners for swapping tips, hints, programs etc. Ove Knudsen, Helgeplasset 48, 5033 Fyllingsdalen, Norway

EARN £££s with your micro. Full step by step instructions. S.A.E. for free details. Mr G Miles, 73 Fairways Avenue, Harrogate, N Yorks HG2 7EN

AMSTRAD CPC6128 green screen modulator, tons of software both serious and games. £250. Tel Hertford (0992) 583887

AMSTRAD 8136 plus mono monitor, 10yrs guarantee on both, over £100 worth of magazines/disks/hardware. Tel for a list. I will split the items if required. Tel Leeds (0532) 585519 after 6pm

PURCHASED NEW March 87 Sinclair 128K ZX Spectrum +2 with 6 games cost £130. Tel (061) 833 9100

LEEDS

ELECTRON COMPUTERS plus power supply—£59.95. Acorn Electron Plus interface—£49.95. Electron software at reduced prices. Answer service out of office hours. Access/Visa. Tel 0532 687735. Software Bargains, 8/8a Regent Street, Chapel Allerton, Leeds LS7 4PE

ATARI 800XL, disc drive, tape recorder, 100s cass + disc software, magazines and books. Perfect condition, boxed as new, only £249. Call after 6pm at 8 T the Croft, Heathtown, Wolverhampton, West Midlands

TRS80 colour computer 2 64K £110 o.n.o. TRS80 5¼" disc drive £140 o.n.o. Both only 4 months old. Tel Tun Wells 36195 after 6.30pm

FOR SALE BBC Viewdata bulletin board modem Model B, Cumana drive, printer. Tel 01 802 8682

PSION Organiser with maths pack and 8K and 16K packs plus RS232 interface £90. Tel 0327 40755 evenings

CBM64, two C2N cassette units, sound digitiser to connect two C2Ns together for 100% back up of any tape software. £300's worth top quality software. Only £90. Tel Weybridge 0932 54281

RECRUITMENT

PROGRAMMERS IMMEDIATELY REQUIRED

Software house requires programmer, ideally in the South West, familiar with 68000 to write arcade game for Atari ST. Game concept has been thoroughly researched and developed.

We have a continuing requirement for programmers conversant with high level languages for product development based on IBM PC, Amstrad PCW & PC, Atari ST & PC.

PLEASE CONTACT:

Veronica 0395 45059 (daytime)

FOR SALE

DUPLICATION

2 MIDLANDS AND NORTHERN ENGLAND

1 SOUTH EAST

3 SCOTLAND

Your complete guide to all the software released this week

Amstrad CPCs

Program *Trio* **Type** Compilation **Price** £9.95 tape £14.95 disc **Supplier** Elite Anchor House Anchor Road Aldridge Walsall West Midlands.

See panel for comment

Program *Slap Fight* **Type** Arcade **Price** £8.95 **Supplier** Imagine Software 6 Central Street Manchester M2 5NS

Program *Samurai Trilogy* **Type** Martial arts **Price** £9.99 tape £14.99 disc **Supplier** Gremlin Graphics Alpha House 10 Carver Street Sheffield



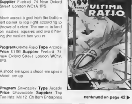
Program *Spaced Out* **Type** Strategy/board style game **Price** £1.99 **Supplier** Firebird 74 New Oxford Street London WC1A 1PS

Move across a grid from the bottom left corner to top right according to throws of a dice. The aim is to land on nasties squares and avoid having the nasties box you in

Program *Ultima Ratio* **Type** Arcade **Price** £1.99 **Supplier** Firebird 74 New Oxford Street London WC1A 1PS

A shoot em up is a shoot em up is a shoot em up

Program *Downsley* **Type** Arcade **Price** Unavailable **Supplier** Top Ten Hits Mil 12 Chiltern Enterprise

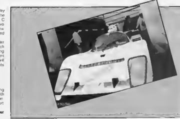


continued on page 42 ▶

Day out at Silverstone

How does the idea of an all expenses paid day out at Silverstone grab you? Be there for the test driving of the Mastertronic sponsored C sports car a Tiga British chassis car with Volvo twin turbo 2.1 litre engine driven by Andrew Ratcliffe one of the Mastertronic team entered for the recent Le Mans 24 hour race

Three winners of our ludicrously easy to enter competition will win the Silverstone trip which will take place one day on the week beginning July 6 (day to be arranged between the winners and Mastertronic Software). Five runners up will get a Mastertronic race team T shirt (one size fits all)



How to enter

Couldn't be simpler. Just answer the following three questions correctly and send them in with the coupon below to Silverstone Competition *Popular Computing Weekly* 12 13 Little Newport Street London WC2H 7PP

1) Which team won the 1987 Le Mans 24 hour race held on June 13–14?

2) Which driver on the winning team was making his 17th competitive appearance in the 1987 Le Mans race?

3) Which Mastertronic game, with a motor racing theme has just chalked up sales of 500,000 units?

Name ....

Address ....

....

....

Daytime telephone number ....

My answers are

1) ....

2) ....

3) ....

This coupon is to be sent to Silverstone competition *Popular Computing Weekly*, 12–13 Little Newport Street, London WC2H 7PP
Closing date for entries Friday, July 3

Entry conditions

Three correct entries will be selected at random from all entries received to determine the three winners. A further five selected at random will win runners up T shirts

The closing date is Friday July 3 (ie you have only one week to get your entries in). Winners will be notified by Mastertronic by phone on that day to arrange their visit. Winners and runners up names will be published in *Popular Computing Weekly* July 10

Only one entry per person please and the judges decision is final

Summer Madness

Amstrad PC1512 at Trade Price!!

Dual Drive Mono (RRP £559)	£474 + VAT
Dual Drive Colour (RRP £729)	£605 + VAT

Printer Bargains

Star NL10	£199 + VAT
Epson RX100 Wide Carriage	£199 + VAT
Parallel Printer Lead	£12 + VAT

Terms and Conditions
Add VAT at 15% to all prices
Delivery £5 per order in Mainland UK
Cash with order

ABBOT COMPUTER PRODUCTS LIMITED
50 High Street
Edgware
Middx HA8 7EP
Telephone: 01-951 5809

Free Your Micro with the MicroStuffer

64K Printer Buffer



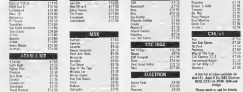
Works with any standard Centronics parallel interface printer ★ Complete with cable and power supply ★ Clear button ★ Multiple copy repeat function ★ Self-test ★ Comprehensive twelve month guarantee

Only £49.95
INCLUDING VAT AND DELIVERY

Frontier Software
PO BOX 113, HARROGATE
NORTH YORKSHIRE HG2 0BE
TEL: 0423 67140

10-DAY MONEY BACK GUARANTEE

LIGHTSPEED SOFTWARE



I would like to order

I enclose Cheque/P.O. No ______ for ______
payable to LIGHTSPEED SOFTWARE
NAME
ADDRESS

Post code ______ Tel. No
Signed ______ Date

LIGHTSPEED SOFTWARE, 60 HIGH STREET, HANHAM, BRISTOL BS15 3DR
Tel: 0272 604130

◀ continued from page 42

Program *Kikstart II* **Type** Arcade **Price** £1 99 **Supplier** Mastertronic 8–10 Paul Street London EC2H 3JY

Program *Hyperforce* **Type** Arcade **Price** £1 99 **Supplier** Mastertronic 8–10 Paul Street London EC2H 3JY

Program *Destructo* **Type** Arcade **Price** £1 99 **Supplier** Mastertronic 8 10 Paul Street London EC2H 3JY

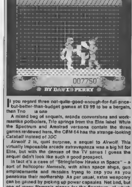
Program *How to Get the Most Out of Your Computer* **Type** Basic utility/Art package **Price** £9 99 **Supplier** The Power House 9 Kings Yard Carpenters Road London E15

The Power House used to be called Alpha Omega and produced budget arcade titles which left the world singularly unlit

The Power House is still producing budget arcade titles but this is a departure from the norm Though you would not guess it from the titles this is a graphics and adventure writing package

It comes on two tapes and is extremely good value for money although at the price do not expect the *Advanced Art Studio* and *Quill* all rolled into one

Imported from US software house Novelsoft



If you regard three not-quite-good-enough-for-full-price-but-better-than-budget games at £9 99 to be a bargain, then Trio is one

A mixed bag of sequels, arcade conversions and workmanlike potboilers, *Trio* springs from the Elite label While the Spectrum and Amstrad versions contain the three games reviewed here, the CBM 64 has the strange-looking *Cataball* instead of *3DC*

Airwolf 2 is, quel surprise, a sequel to *Airwolf* This virtually impossible arcade extravaganza was a big hit for Elite, but with the demise of the TV series I guess the sequel didn't look like such a good prospect.

In fact it's a case of "Stringfellow Hawke in Space" – a sort of helicopter *Nemesis*, with alien space ships, gun emplacements and missiles trying to zap you as you penetrate their mothership As per usual, extra weaponry can be gained by picking up power capsules Not bad, but one of many *Nemesis* clones for the Spectrum, of which Hewson's *Zynaps* is probably the best

Great Gurianos is an oddity, a coin-op conversion featuring an armoured warrior moving right to left through a holocaust of attribute clashes You have a shield which can be held high, middle or low, and a sword which can slash within the same parameters Hitting certain flying boogies gives you temporary invulnerability, strengthens your armour or restores your shield Amusing in a cartoony sort of way

3DC (Three-d sea) is an Ultimate-style diagonal perspective arcade adventure set in an undersea world, where your task is to collect the bits required to build a submarine Ink-squirting octopi and wriggly eels add to the aquatic japes.

What can I say? All pretty good, no classics, but a few hours of much appreciated entertainment. Good for birthdays

Chris Jenkins

Program *Golden Oldies* **Type** Compilation **Price** £9 95 **Supplier** Diamond Games/Robtek Unit 4 Isleworth Business Complex St Johns Road Isleworth Middlesex

Golden Oldies it says at the top Twenty New Games it says at the bottom

Apparently this means 20 not very new games but previously unreleased Anyway the 20 include *Lawn Tennis* (very green) *Alien Attack* (enough said) *Championship Backgammon KO Boxing Othello Ten Pin Bowling Astronaut Battle* and *Yahtzee*

What you might call a mixed bag If you're a professional boxer from outer space who'll be taking their backgammon set to Wimbledon this week you'll love this

Program *Quartet* **Type** Arcade **Price** £9 99 tape £14 99 disc **Supplier** Activision 23 Pond Street London NW3

See panel for comment

Program *The Last Ninja* **Type** Martial arts **Price** £9 99 tape £14 99 disc **Supplier** System 3/Activision 23 Pond Street London NW3 4UE

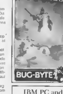
Program *Aztec Challenge* **Type** Arcade **Price** unavailable **Supplier** Top Ten Mil 12 Chiltern Enterprise Centre Station Road Theale Berkshire R[illegible] 4AA



Program *Spellseeker* **Type** Arcade Adventure **Price** £2 99 **Supplier** Bug Byte Victory House Leicester Place London WC2H 7NB

Program *Snap Dragon* **Type** Martial arts **Price** £8 95 tape £12 95 disc **Supplier** Bubble Bus 87 High Street Tonbridge Kent TN9 1RX

Program *Denarius* **Type** Arcade **Price** £1 99 **Supplier** Firebird 74 New Oxford Street London WC1A 1PS



IBM PC and compatibles

Program *Hardball* **Type** Baseball simulation **Price** £19 99 **Supplier** US Gold Units 2 and 3 Holford Way Holford Birmingham B6 7AX

See Atari ST for comment

MSX

Program *Voidrunner* **Type** Arcade **Price** £2 99 **Supplier** Mastertronic 8–10 Paul Street London EC2H 3JY

Program *Flash Gordon* **Type** Arcade **Price** £2 99 **Supplier** Mastertronic 8 10 Paul Street London EC2H 3JY

Program *Storm Bringer* **Type** Arcade Adventure **Price** £2 99 **Supplier** Mastertronic 8 10 Paul Street London EC2H 3JY

Oric 1/Atmos

Program *Xenon III* **Type** Arcade **Price** £8 50 **Supplier** UK Software Unit 3c Moorfields Moor Park Avenue Bispham Blackpool Lancs

Program *Maze Rally* (48K only) **Type** Arcade **Price** £6.95 **Supplier** FGC Distribution 20 Meadowcroft Euxton Chorley Lancs PR7 6BU

Program *Manic Miner* **Type** Arcade Adventure **Price** £7.95 **Supplier** Software Projects Bearbrand Complex Allerton Road Woolton Liverpool L25 7SF



Spectrum

Program *Catch 23* **Type** Arcade Adventure **Price** £7.95 **Supplier** Martech Martech House Bay Terrace Pevensey Bay East Sussex BN24 6EE

Martech's contribution to the megagame genre *Catch 23* has millions of mapable locations and involves you in the sort of quest (find CK23 military test site blow up island overrun by the enemy) in which every type of computer gameplay will be needed at some point (apart from pixies and Brian Jacks)

So there's adventure style location finding and exploring arcade style blasting the baddies plus strategy style read the dossier on the 16 kidnapped scientists and work out which one's hidden where so that you can rescue them

A formidable package presented on the Spectrum – in black and white wire frame graphics The baddies look dead real

Program *Rubicon* **Type** Arcade **Price** £2.99 **Supplier** Bug Byte Victory House Leicester Place London WC2H 7NB

Program *Inspector Flukeit* **Type** Arcade Adventure **Price** unavailable **Supplier** Top Ten Hits MI 12 Chiltern Enterprise Centre Station Road Theale Berkshire RG7 4AA

Program *Storm Bringer* **Type** Arcade Adventure **Price** £2.99 **Supplier** Mastertronic 8 10 Paul Street London EC2H 3JY



Program *How to Get the Most Out of Your Computer* **Type** Basic utility/Art package **Price** £9.99 **Supplier** The Power House 9 Kings Yard Carpenters Road London E15

See Commodore 64 for comment

Program *Spaced out* **Type** Arcade **Price** £1.99 **Supplier** Firebird 74 New Oxford Street London WC1A 1PS

See Amstrad for comment

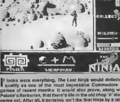
Program *Galletron* **Type** Arcade **Price** £1.99 **Supplier** Bulldog/Mastertronic 8 10 Paul Street London EC2H 3JY

Program *Trio* **Type** Compilation **Price** £9.95 **Supplier** Elite Anchor House Anchor Road Aldridge Walsall West Midlands

See panel for comment

Program *Doc the Destroyer* **Type** Combat/Arcade **Price** £8.95 **Supplier** Melbourne House 8 10 Paul Street [illegible]

SILVER 199 RANGE
SPACED OUT



If looks were everything, *The Last Ninja* would definitely qualify as one of the most impressive Commodore 64 games of recent months It would also prove, along with Palace's *Barbarian*, that there's life in the old chop 'n' slash genre yet. After all, it certainly isn't the first Ninja by a mile

In this case, the added thrill consists of the multi-screen, arcade adventure element which so conspicuously failed to make *Fist II* take off, refined to a much higher level

Your Ninja warrior travels lonely roads through jewelled gardens, past exotic temples and through desolate dungeons. The backgrounds are sumptuously detailed, and the screen design – with the action seen from diagonal perspective in the main part of the screen and icons indicating strength, possessions, enemy strength and so on, on the right and bottom – making *The Last Ninja* tremendously attractive to look at

While the animation and sound effects are admirably smooth it's the control aspect which lets the game down. Depending on which weapons you have found and picked up along the way, there are dozens of moves available, and I, 13th Dan on *Way of the Exploding Fist*, master of Karate and chief head-chopper, couldn't persuade my Ninja to make the right move twice in a row

When I wanted to chop, he jumped, when I wanted to run, he ducked, when I wanted to fight, he just stood and bled

Despite difficulties in getting to grips with the game, this massive two cassettes full must be worth checking out. At £9.99, if you can master it, it may well be worth the extra effort. And the wait.

Chris Jenkins

CHARTS

Top Twenty

1	(1)	Barbarian	Palace
2	(3)	BMX Simulator	Code Masters
3	(2)	Milk Race	Mastertronic
4	(6)	Football Manager	Addictive
5	(5)	Paperboy	Elite
6	(–)	I Ball	Firebird
7	(4)	Four Great Games	Micro Value
8	(10)	Six Pack	Hot Pak
9	(9)	Army Moves	Imagine
10	(7)	Enduro Racer	Activision
11	(8)	Feud	Bulldog
12	(11)	Gauntlet	US Gold
13	(13)	Olympic Spectacular	Alternative
14	(18)	Stormbringer	Mastertronic
15	(18)	Leaderboard	Access - US Gold
16	(12)	Ghost Hunters	Code Masters
17	(14)	Five Star Games 2	Beau Jolly
18	(–)	Red Arrows	Alternative
19	(17)	Konami Coin-Op Hits	Imagine
20	(–)	Deeper Dungeons	US Gold

All figures compiled by Gallup/Microscope

The never-ending march of technology

No matter how technologically advanced a machine is thrown in the general direction of the public, they always conquer it. A machine may be released to an awe-inspired public enthusing about its virtues, but three days later there are gurus who have been there and back twice.

When the late ZX80 first entered the public arena, one could almost hear the gasp coming from the line of a thousand exalted people. Although no one seemed to understand the meaning of 1K, it didn't matter after all: whatever it is it must be good! So people rushed off their £99.99 with romantic ideas of computerised homes and better lives. What they received however was the beginning of a new era in computer technology.

After some time, other computers from different manufacturers began to spring up. These machines possessed unimaginable powers such as colour displays and 16K memories: now these really must make the tea. Programmers everywhere were freed of prime number calculators, guess the number games and out of memory errors. This was the time when 64K was so much memory no-one could ever hope to fill it; disc drives were the preserve of the Americans and those few British who could afford such a luxury. A luxury it certainly was, especially if you'd just paid the best part of £400.00 for the computer and tape deck.

Surprisingly, the computer market was allowed to grow stagnant after this point, a case of the companies resting on their laurels. Sure, new computers were produced but none of them really were *new*. Consequently, computer sales dropped. No one is going to buy a product similar to one they have if it does not offer something substantially more. This made it possible for incredibly large software bases to build up for certain machines, something which is extremely difficult to break. Any new micro after this point had to be revolutionary to break into the market.

These revolutionary machines have now arrived in the form of 16-bit systems. Based on the Motorola MC68000 chip, they have excellent processing power, brilliant graphics and true business capabilities, although it is now widely accepted that computers aren't much good at making tea.

So the cycle has started again. Machines are more powerful and have larger memories. Although strangely enough I'm still all for even more memory, with legitimate reasons this time. As machines grow in power, it is inevitable that memory is used up in an equally consistent manner. If it's not, then you're not using the machine to full advantage.

In six or seven years, we come from a machine which had barely enough memory to write a calculator program, to machines which copy the latest arcade game down to the last detail and look after your business affairs with exceptional competence.

This can only be said to be wondrous and all credit where it is due, but what of the future? We'll be seeing colour graphics of true photographic quality, synthesisers for sound chips and possibly even voice synthesisers that sound real. Memories will naturally increase, and soon we'll be talking in higher denominators than megabytes.

Perhaps in a few years time I'll be upgrading because 15 gigabytes just isn't enough. Between you and me, I think that is a certainty.

P Rowley

Puzzle No 263

I have a standard pack of playing cards comprising of the 52 cards plus one joker. Taking these cards, I propose to ask a friend to try an experiment.

He is first to decide on any number in the range 1 to 99 inclusive. He is then to transfer this number of cards, one at a time, from the top of the pack to the bottom. He is then to discard the next card.

Using the same number that he has already decided upon, he is to repeat the procedure until only one card remains. For example, if he chose the number 15, he would transfer 15 cards, discard the next (16th) card, and then transfer another 15 cards, discard the next, and so on.

Of course, this might entail a rather lengthy process, especially if the number chosen was on the large side!

Now, you may recall that there are fifty three cards as there is one joker amongst them. I want to ensure that when 52 cards have been discarded by this process of elimination, the final card that is left is *not* the joker. Of course, I have no way of knowing in advance what number my friend is going to choose. However, there are a number of positions in the original deck that I can contrive to place the joker so that I can achieve this end.

Can you say what these positions are (counting from the top of the deck)?

Solution to Puzzle No 258

After the example given, the next three sets of nearly cubes are:

(20*21*22) + (54*55*56) = (55*56*57)
(30*31*32) + (55*56*57) = (58*59*60)
and (38*40*41) + (70*71*72) = (74*75*76)

The program generates pairs of nearly cubes in sequence (lines 20 and 40). The combined volume of these is found at line 50 and this value is then tested to determine if it is a possible value for the volume of a larger nearly cube. This is done at lines 60 to 100, starting with an initial value equal to the size of the larger of the two smaller nearly cubes (line 60).

Winner of Puzzle 258

This week's winner is Paul Byford of Tamworth, Staffs, who will receive £10.

Rules

The closing date for Puzzle 262 is July 15.

```
10 A=2 TALLY=0
20 AV=A*(A+1)*(A+2)
30 FOR B=1 TO A 1
40 BV=B*(B+1)*(B+2)
50 TV=AV+BV
60 N=A
70 NV=N*(N+1)*(N+2)
80 IF NV=TV THEN PRINT A B,N TALLY=TALLY+1
90 IF TALLY=4 THEN STOP
100 IF NV<TV THEN N=N+1:GOTO 70
110 NEXT B
120 A=A+1 GOTO 20
>
```

HACKERS



VIP PROFESSIONAL
THE POWER OF LOTUS 1-2-3™ ON THE ATARI ST
ATARI
ST SOFTWARE
'LOTUS PLUS GEM'
Probably the most impressive program to have been released so far for the Atari ST range VIP Professional is an extremely easy to use integrated spreadsheet database and graphics program which is identical both in features and commands to Lotus 1-2-3™ To give you the best program possible on your Atari ST VIP Professional integrates the three essential applications of Lotus 1-2-3™ with the smart face of GEM The same spreadsheet analysis information management and extraordinary business graphics are all combined in one easy to learn affordable package What's more VIP Professional not only has all the features of 1-2-3™ you can also type the same commands to do the same thing Or better still you can use a mouse to make it even simpler! VIP requires only one disk drive to operate and also works with a hard disk drive It is compatible with both monochrome and colour systems Probably the most surprising feature of VIP Professional is not its total compatibility with Lotus 1-2-3™, nor its ease of use with the GEM environment but its price Lotus 1-2-3™ for the IBM PC AT costs £395 (+VAT=£454 25) whereas VIP Professional for the Atari ST range of computers is a mere £199 (+VAT=£228 85) That's nearly HALF PRICE!
INTEGRATED
SPREADSHEET
DATABASE
GRAPHICS
WITH
LOTUS 1-2-3
COMPATIBILITY
£199
(+VAT=£228 85)
1 SPREADSHEET
2 DATABASE
3 GRAPHICS
OFFICIAL UK VERSION
The official UK version of VIP Professional has a pound (£) sign as a standard part of its character set Other versions have also been imported unofficially from the USA and have a dollar ($) sign instead of a £ sign These versions will not be supported by the UK distributors or their dealers Ensure that the VIP you buy is the official UK version not an unofficial import with incorrect characters.
Integrated Spreadsheet
SILICA SHOP Ltd, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX
Tel 01-309 1111
INFORMATION REQUEST FORM
To: Silica Shop Ltd, Dept PCWK 0587, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX
Please send me further details of VIP Professional for the ST
Mr/Mrs/Ms
Initials
Surname
Address
Postcode
I am interested in the Atari ST
I already own an Atari ST


"MISS THIS AND YOU'RE MISSING THE BEST PROGRAM OF THE YEAR!"
WIZBALL
NOW for the SPECTRUM AMSTRAD
SPECTRUM
£7.95
AMSTRAD
"WIZBALL IS THE FINEST RELEASE THIS YEAR"
Ocean Software Limited Ocean House 6 Central Street Manchester M2 5NS Telephone 061 832 6633 Telex 669977 Oceans G